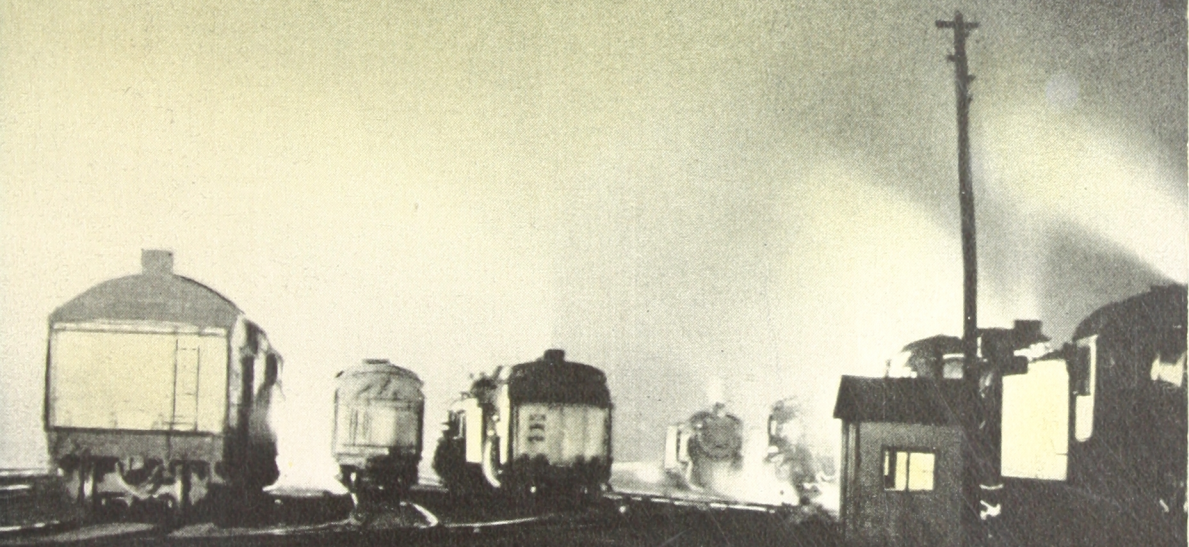


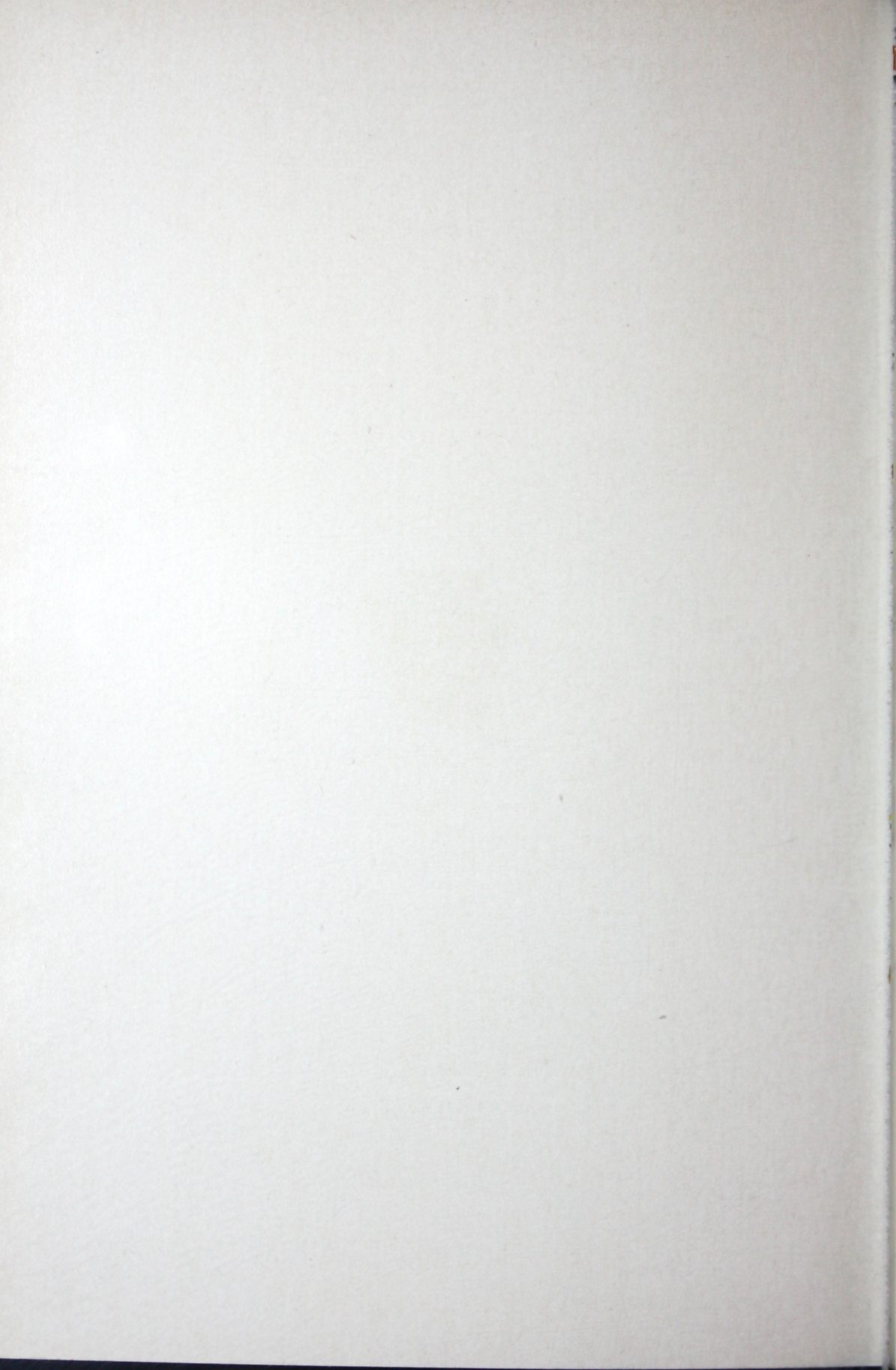
# GOLDEN GLOW

218-7.



ELECTRIC SERVICE SUPPLIES Co.



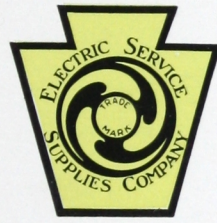




JUN 12 '28

# FLOODLIGHTING PROJECTORS

Golden Glow  
or  
Crystal Mirror



Bulletin No. 216

## ELECTRIC SERVICE SUPPLIES Co.

Railway, Mining and Industrial Electrical Supplies

|   |               |                                |
|---|---------------|--------------------------------|
| PHILADELPHIA  | NEW YORK      | CHICAGO                        |
| 17th and Cambria Sts.                                       | 50 Church St. | Illinois Merchants' Bank Bldg. |
| PITTSBURGH  | BOSTON        | SCRANTON                       |
| 839 Oliver Building   | 88 Broad St.  | 316 N. Washington Ave.         |
|   |               | DETROIT                        |
|   |               | General Motors Building        |
| Lyman Tube & Supply Co., Ltd., Montreal, Toronto, Vancouver |               |                                |



COPYRIGHT 1925

BY

**ELECTRIC SERVICE SUPPLIES Co.**

PHILADELPHIA AND CHICAGO

---

All Rights Reserved



## GOLDEN GLOW FLOOD LIGHTING



Golden-Glow Flood-Lighting  
Yards of Norfolk & Western Railway, Roanoke, Va.  
Illumination Intensity 0.06 Foot Candles.

Flood-lighting is a term that has been applied to a lighting system which has come into general use in recent years. The type of lighting unit used for illumination of this character comprises essentially a relatively powerful light source, and a reflector or lens combination, to confine a large portion of the light from the source within a comparatively small angle. The flood-light generally lies somewhere in the middle ground between the searchlight with its extremely narrow angle of beam distribution, and which finds its greatest usefulness at comparatively long ranges, and the more common forms of outdoor lighting unit with comparatively wide distribution angles and a consequent short effective range. The flood-light comprises a high power incandescent lamp having a filament which is generally larger than is permissible for moderate and long range searchlight work and a reflector which generally approaches a parabola in form. Units of this sort are available which use lamps ranging from 250 to 2000 watts in capacity and reflectors ranging in diameter up to twenty-three inches or more.

Lighting units of this character have been applied successfully to a great many lighting problems involving relatively large areas. Exterior illumination of public buildings and business institutions may be provided in a pleasing manner. Recreation areas, such as golf courses and bathing beaches, may be conveniently lighted with complete satisfaction. Lighting problems of this nature are solved by flood-lighting, chiefly because large areas may be provided with uniform illu-



## GOLDEN GLOW FLOOD LIGHTING

mination, light sources may be located at a suitable point remote from that at which illumination is to be used; and economy of installation and operation surpass any other form of lighting unit in this field. Flood-lights may be readily concealed and the observer's attention is not distracted by the presence of more or less glaring light sources within the field of view, while the architectural beauty or novelty of the illumination provided is rendered still more effective.

Flood-lighting has also been applied successfully in what may be termed commercial lighting. Railroad yards, storage areas, crane runways, construction projects and many other industrial applications of flood-lighting have been brought about by the demonstrated value of adequate lighting in improving morale and reducing labor costs and accident hazards.

The steam railroad field presents an unusual opportunity to apply flood-lighting in an advantageous manner. The operation of railroad yards on a twenty-four hour schedule is common. Most railroads are hampered somewhat by insufficient trackage, and any condition that will permit yard forces to handle more cars in a given period may be expected to produce large savings in car service charges. Losses chargeable to damage caused by rough handling reach surprisingly large totals, and an additional related loss from obstructions to traffic movement due to the same general cause is quite common. Losses due to pilferage, and to accidental personal injury are also of considerable importance.

Flood-lighting has been applied to this field of industrial lighting and a large degree of success has attended its use. Reports from various properties differ somewhat in exact figures, but all reports show advantages resulting from the application of flood-lights that show large savings in operating expense and which are out of all proportion to the investment required for suitable flood-light installations.

It will be of interest to quote from the report of the Illumination Committee of the Railway Electrical Engineers Association for 1924:—

"Your committee was directed to continue its study of the subject of the illumination of railroad yards by means of the flood-lighting system. As there has been comparatively little development work along these lines during the past year that has reached the state where installations are in actual service, it has not been possible to give this subject as much consideration as desired. There are indications that this system is rapidly becoming standard for modern illumination practice for classification yard service. From an incomplete survey there have been reported 35 railroads having 90 yards equipped, using approximately 2,100 flood-lighting units.

"From data compiled by one railroad for a period of several months before and after one of their classification yards had been equipped with a modern flood-lighting installation the following results have been secured:

"1. Percent increase in number of cars handled night-time after installing lighting system, 15.5.

"2. Percent decrease in average cost of damage per car handled at night-time, 21.

"3. For period under observation there were 12 personal injuries occurring at night-time, while for corresponding period, after installation of the system, there were none that could be attributed to lack of illumination.

"4. Lighting system claimed to be of valuable assistance to the police department in carrying on policing work, etc."

A number of other benefits of minor nature were obtained as well, but these items alone justify the expenditure required to install flood-lighting systems.



## GOLDEN GLOW FLOOD LIGHTING

In most cases of outdoor lighting, by reason of the large areas involved, it is essential to obtain the maximum of useful light with the minimum of energy expended. The art of lighting has made such tremendous strides and such large advantages have been obtained from each successive increase of illumination levels, that we are prone to consider good illumination as dependent only upon intensity, upon the working surface, and have almost lost sight of the factors of direction and light quality.

It is obvious that if brightness alone is considered, the expense for effectively lighting large areas will be excessive. The recognition of this excessive cost has resulted in installations that were designed with the idea of keeping the cost at a reasonable figure, locating lights where space was available, obtaining as much brightness on the working surfaces as possible, and so distributing that brightness as to produce the maximum of useful effect. It may be noted that in this class of work it is rarely necessary to observe fine details, but rather it is important merely to be able to distinguish large objects,—provide an illumination which will show irregularities of surface and roadway, and provide a maximum range of effective vision, by which men and objects may be distinguished; an illumination which will enable car numbers to be read easily and provide sufficient light to see switch points and readily distinguish their settings.

It is possible to so design a lighting system for a railroad yard so as to obtain by contrast, back-ground illumination, and silhouetting; a sharpness of vision and an absence of the factors that tend to cause eye fatigue; which is out of all proportion to the actual light intensity delivered. For indoor lighting where intensities of a high order are easily obtainable it is considered good practice to so locate the light sources as to produce shadows sufficiently distinct to permit comfortable vision, but in meeting this condition it is necessary that the shadows be essentially soft in character; they need not, however, be uniform in direction or magnitude. With outdoor work intensities of this high order are not practicable because of excessive cost, and soft shadows would not necessarily be desirable, even could they be obtained. With the low intensities available it is necessary to obtain the maximum degree of contrast possible. To this end shadows should be reasonably sharp, and as uniform in direction and magnitude as possible.

The development of flood-lighting has supplied a means for providing more illumination and that of a character much better suited to outdoor industrial lighting requirements than has been heretofore available. Flood-lighting enables the use of a comparatively small number of lighting units mounted in groups, which may be spaced at relatively large distances. It provides a very uniform distribution of light, enables the location of lighting units outside the range of normal vision and provides a means for obtaining a desirable degree of contrast and background illumination, thus enabling a much longer range of vision than is possible with any other type of lighting available. It removes obstructions since poles spaced at short intervals over the area are no longer necessary for lighting unit support. Flood-lighting develops to a high degree the qualities of contrast and reasonably sharp shadows, uniform in direction, which is so essential for good visual conditions at comparatively low illumination levels.

Flood-lighting has been applied in a great many ways. There are perhaps two extreme cases that may be considered. In the one case a flood-light unit, mounted on a tower, is trained on a definite area, generally at a comparatively short distance from the base of the tower. In this case the projector employed generally has a wide distribution angle and the installation is treated much as though the flood-light were a modified pendant type unit, which by reason of the reflector behind it and the concentration of the light into a smaller zone, will produce a



## GOLDEN GLOW FLOOD LIGHTING



Golden Glow Flood-Lighting  
Yards of Norfolk & Western Railway, Roanoke, Va.  
Illumination Intensity 0.06 Foot Candles.

higher intensity on surface illuminated. In installations of this character it has been common practice to have a given area lighted by one projector only.

The second extreme case may be found in an extreme centralization of flood-light units where towers or pole structures are spaced 2000 to 3000 feet apart. An attempt is made from a single tower location to cover all the area within the range of the flood-lights. This again is generally treated as a problem of laying down light intensity of a desired degree.

In general, it is recommended that design of flood-light installations be kept in the middle ground and that neither of the extremes mentioned above be used. Centralization of flood-lighting units should be pushed to the maximum to obtain minimum installation cost. The advantages to be realized by lighting a given area by flood-lights from two opposed locations, utilizing background illumination and contrast, maintaining at the same time suitable values of direct illumination, are considered of major importance. On this basis, the recommended type of installation requires a few more towers than would be required by the extreme centralized type, and a great many less than would be required by the extreme distributed type of installation.

A flood-light installation must be carefully planned if maximum benefits are to be obtained from its use. Factors of tower location, ranges used and illumina-



## GOLDEN GLOW FLOOD LIGHTING



Golden Glow Flood-Lighting  
Yards of Southern Railway, Asheville, N. C.  
Illumination Intensity 0.06 Foot Candles.

tion intensities provided need be carefully realized, and annoying conditions of glare effect be avoided.

Inasmuch as glare appears to be the largest single factor active in preventing the successful use of higher illumination intensities at present, the following comments will be of interest:

Glare may be defined as, "Brightness within the field of view, of such character as to cause discomfort or interference with vision," and since discomfort of this character is largely physiological and psychological, it has not been evaluated in exact engineering terms as yet, nor can it be measured except under favorable laboratory conditions, and then only in a few special cases.

In general, however, there are three broad classes into which fall the various kinds of glare generally experienced; these are referred to as "Brightness Glare," "Contrast Glare" and "Veiling Glare." Brightness and Contrast Glare seem to be of most importance in flood-lighting work, and at present appear to be the limiting factors that prevent the successful use of intensities much in excess of the values noted below.

It may be stated with assurance that a very definite illumination level exists, above which glare is present in a considerable degree and operates to materially reduce the effectiveness of the flood-light installation. The importance of sound engineering advice in planning a flood-light installation cannot therefore be too strongly emphasized.



## GOLDEN GLOW FLOOD LIGHTING

A large amount of investigational data is available bearing on the relation of the visual functions to colored light. All of these investigations have shown that visibility conditions are largely improved by monochromatic light; that is, by light of a single color, because of the fact that all of the rays entering the eye are brought to a sharp focus upon the retina. The lens of the eye operates to adjust to any wave length within the visible range. In the presence, however, of white light, the eye most readily adapts itself to light in the yellow-green portion of the spectrum. It has been definitely established that monochromatic light enables details to be seen with lower illumination intensities than is possible using white light. It has also been established that different colors of monochromatic light do not all possess in the same degree the ability to disclose details readily, and it appears that the maximum detail for a given illumination intensity is disclosed by light in the yellow-green portion of the spectrum.

Without entering a discussion of the basic theories involved in an attempt to explain these facts, it is sufficient to note that "Golden Glow" reflectors have by reason of their color, functioned more successfully in service conditions than any other type of reflector that has been used. The performance of these reflectors is sufficiently superior to those of the ordinary clear glass as to be quite pronounced, even to an inexperienced observer. The popularity of "Golden Glow" reflectors in the head-lighting and flood-lighting fields is due entirely to the large reduction in glare effected without involving any sacrifice of projection efficiency. Owing to their superior performance, "Golden Glow" reflectors are unhesitatingly recommended for all classes of lighting service where improved visibility conditions and absence of eye strain are important factors.

It has been found that mounting heights of seventy feet or more, with illumination intensities up to values of 0.15 foot candles, with maximum ranges up to thirty-five hundred feet, may be used safely with "Golden Glow" flood-lights. We strongly recommend that the yard area illuminated be covered by light coming from two sensibly opposed directions, and that the light be directed as nearly parallel to the tracks as possible. It has been found that illumination intensities much in excess of the value noted above cannot be used successfully except for yards where traffic is moving in one direction only, the flood-lights being directed with traffic. This because of glare that becomes objectionable when looking toward the bank of flood-lights. The same comments also apply in a measure to an unbalanced system of opposing lighting in which a preponderance of the light is directed with traffic.

In general, for flood-lighting installations made in accordance with the general comments above, illumination levels of 0.04 to 0.10 foot candles have been found satisfactory for receiving yard illumination, and intensities recommended lie within the limits of 0.05 to 0.08 foot candles. For classification yard illumination, intensities giving satisfactory service range from 0.06 to 0.14, and intensities recommended lie within the limits of 0.09 to 0.12 foot candles.

For lighting around engine terminals, ash and inspection pits, engine storage tracks, roundhouse approaches, turntables, etc., illumination values as high as 0.25 may be used advantageously if care is exercised in avoiding glare. Recommended intensities range from 0.10 to 0.15 foot candles.

All illumination values given above are average values for the entire area under consideration. It should be noted that important points in the area should be provided with higher illumination than is indicated in the figures noted above.



## GOLDEN GLOW FLOOD LIGHTING



Golden Glow Flood-Lighting  
Yards of Southern Railway, Asheville, N. C.  
Illumination Intensity 0.06 foot candles

This applies particularly to ladder tracks, cross-overs, scale house areas, humps and other important points.

This company has been identified with most of the major installations of railroad yard flood-lighting, and has been uniformly successful in that installations made in accordance with our recommendations have met with unqualified approval in the field. A large factor in this enviable record is the use of our "Golden Glow" reflectors, which are unsurpassed in reducing glare effects without reducing the effective illumination obtained. This element, combined with our large experience, enables us to serve this field in providing engineering service of a high order. This service is available upon request without incurring any obligations whatever on the part of the company having need for such services.



## FLOOD LIGHTING PROJECTORS

Golden Glow or Crystal Mirror



Type FLA-1419 (Cast Aluminum Case)

Type FLA-1419 flood-lighting projectors consist of a cast aluminum alloy case approximately  $\frac{1}{8}$  inch thick, equipped with hinged rear door made of the same material and in which a 14 inch diameter Golden Glow or Crystal Mirror glass reflector is mounted.

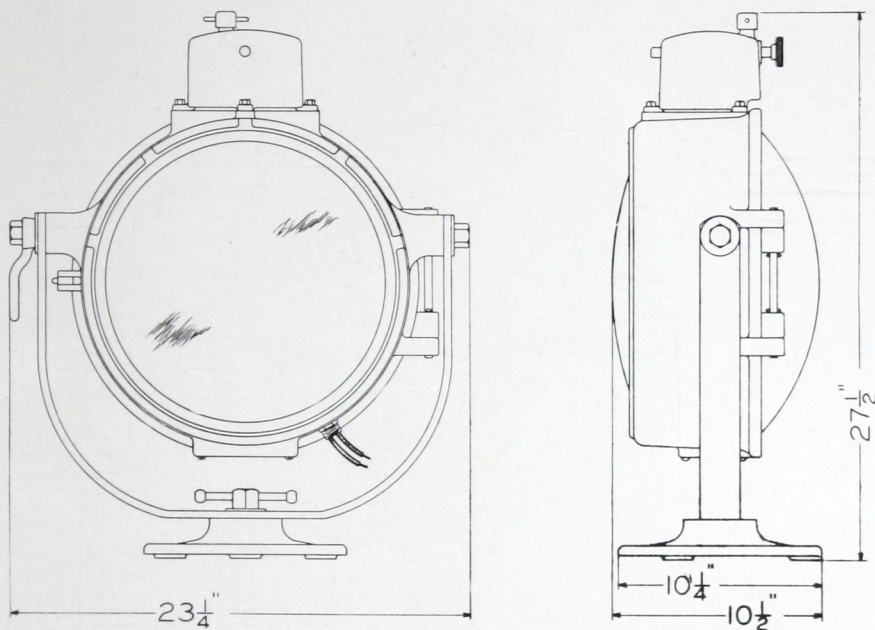
This construction provides easy access to the reflector for inspection or cleaning, without disturbing the lamp bulb or its focus.

The front of the light is regularly equipped with a curved special heat resisting glass, approximately  $\frac{1}{4}$  inch thick, moulded to the desired shape. This glass being subjected to two annealing operations to thoroughly remove all strains that might be present, results in the practical elimination of glass breakage and consequent reduction in maintenance cost. The hood portion of the case is also made of aluminum and provides mounting for the focusing device, operated from the outside; as well as providing a baffled ventilator for the top of the flood-light. A screened opening at the bottom of the case provides the required circulation of air, including the space behind the reflector, resulting in a well ventilated and yet weatherproof enclosure.



## FLOOD LIGHTING PROJECTORS

Golden Glow or Crystal Mirror



Dimension Diagram

The focusing device is fitted with a Mogul socket, and is adapted for use with standard 750 to 1500 watt type C Mazda lamps. All parts are made entirely of brass and provide for adjustment in all directions with means for locking in position. All such adjustments are made from the outside.

Further data covering the installation of flood-lighting projectors are given on page 63.

Principal dimensions are shown in the diagram above and complete unit weighs approximately 59 pounds.

The characteristic curves showing the performance of this type flood-light are shown by Figures 1, 2, 3, 4 and 5, on pages 23, 24, 25 and 26.

Prices do not include incandescent lamps which are listed on page 22.

| List No. | Type     | Reflector Mirror | List Price<br>Each |
|----------|----------|------------------|--------------------|
| 23232    | FLA-1419 | Golden Glow      | \$80.00            |
| 23327    | FLA-1419 | Crystal          | 80.00              |



## FLOOD LIGHTING PROJECTORS

Golden Glow or Crystal Mirror



Type FL-1419

The type FL-1419 flood-light projector is suitable for illuminating large areas and may be used at maximum ranges of 2500 to 3000 feet, and finds wide application for lighting in railroad yards, storage areas and yards in industrial plants and construction projects.

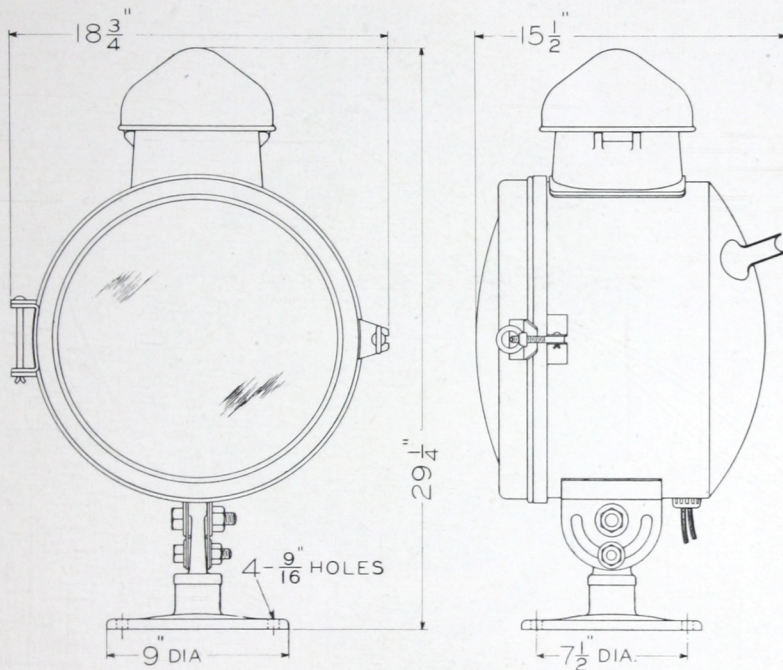
The flood-light case is built of lead coated sheet steel, spot welded, providing an extremely rugged construction. The door seats on an impregnated gasket of braided jute, making a weather-tight closure. Suitable ventilation is provided to avoid excessive operating temperatures. The focusing device, providing adjustment in all directions for the lamp, is enclosed in a cast iron housing, access being provided by a hinged cover. The flood-light is mounted from two pressed steel quadrant supports engaging a cast swiveling base, providing both vertical and horizontal adjustments, following which the flood-light may be securely locked in position.

The front of the light is regularly equipped with a curved special heat resisting glass, approximately  $\frac{1}{4}$  inch thick, moulded to the desired shape. This glass being subjected to two annealing operations to thoroughly remove all strains that might be present, results in the practical elimination of glass breakage and consequent reduction in maintenance cost.



## FLOOD LIGHTING PROJECTORS

Golden Glow or Crystal Mirror



Dimension Diagram

The flood-light is provided with a Mogul socket, permitting the use of 750, 1000 or 1500 watt lamps in the standard P. S. bulb having a light centre length of  $9\frac{1}{2}$  inches.

The characteristic curves showing the performance of this type flood-light are shown by Figures 1, 2, 3, 4 and 5, on pages 23, 24, 25 and 26.

The following list prices do not include incandescent lamps, which are listed on page 22.

| List No. | Type    | Reflector Mirror | List Price<br>Each |
|----------|---------|------------------|--------------------|
| 20512    | FL-1419 | Golden Glow      | \$53.00            |
| 20515    | FL-1419 | Crystal          | 53.00              |



## FLOOD LIGHTING PROJECTORS

Golden Glow or Crystal Mirror



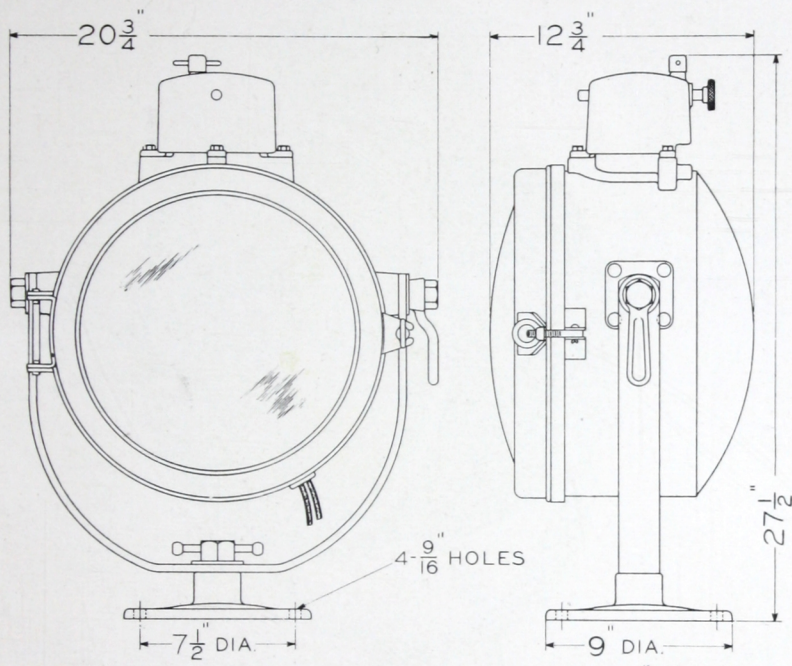
Type FLB-1419

Type FLB-1419 flood-light projector is similar in construction to the type FL-1419, the difference being that it is mounted in a fork on side trunnions, making it more convenient in adjusting to desired position. It is also equipped with a focusing device of the same type as used on type FLA-1419 projector and which is operated entirely from the outside. The front door is regularly equipped with a curved special heat-resisting glass approximately  $\frac{1}{4}$  inch thick, moulded to the desired shape. This glass being subjected to two annealing operations to thoroughly remove all strains that might be present, results in the practical elimination of glass breakage and consequent reduction in maintenance cost.



## FLOOD LIGHTING PROJECTORS

Golden Glow or Crystal Mirror



Dimension Diagram

The flood-light is provided with a Mogul socket permitting the use of 750, 1000 or 1500 watt lamps in the standard P. S. bulb having a light centre length of  $9\frac{1}{2}$  inches.

The characteristic curves showing the performance of this type flood-light are shown by Figures 1, 2, 3, 4 and 5, on pages 23, 24, 25 and 26.

The following list prices do not include incandescent lamps which are listed on page 22.

| List No. | Type     | Reflector Mirror | List Price<br>Each |
|----------|----------|------------------|--------------------|
| 23353    | FLB-1419 | Golden Glow      | \$56.25            |
| 23354    | FLB-1419 | Crystal          | 56.25              |



## FLOOD LIGHTING PROJECTORS

Golden Glow or Crystal Mirror



Type DDB-1419

The type DDB-1419 projectors are used for flood-lighting service where illumination is needed from a quickly and easily controlled source.

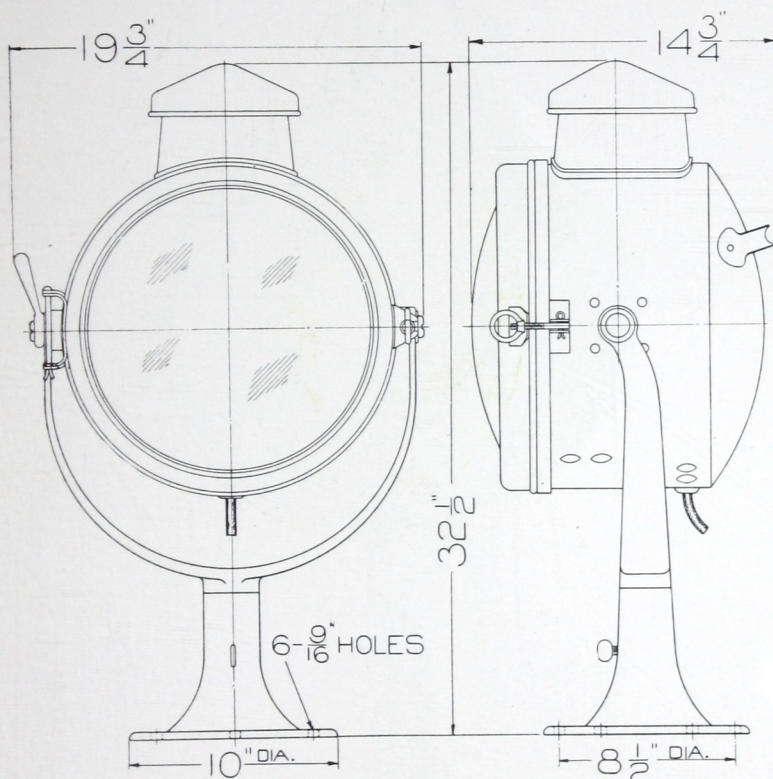
The construction details are identical with those for the FL-1419 described on page 12, except that the quadrant mounting is replaced by a heavy malleable iron fork and side trunnions. Quick and easy adjustment in any direction is thus provided together with a positive lock for screwing the flood-light in position where desired.

Type DDB-1419 projectors are fitted with a 14-inch Golden Glow or Crystal mirrored glass reflector and a Mogul socket adapted to use standard 750 to 1500 watt type C Mazda lamps and are equipped with a focusing device by which the filament may be brought to the focal centre of the reflector.



## FLOOD LIGHTING PROJECTORS

Golden Glow or Crystal Mirror



Dimension Diagram

The front of the light is regularly equipped with a curved special heat resisting glass, approximately  $\frac{1}{4}$  inch thick, moulded to the desired shape. This glass being subjected to two annealing operations to thoroughly remove all strains that might be present, results in the practical elimination of glass breakage and consequent reduction in maintenance cost.

The characteristic curves showing the performance of this type flood-light are shown by Figures 1, 2, 3, 4 and 5, on pages 23, 24, 25 and 26.

Price does not include incandescent lamps which are listed separately on page 22.

| List No. | Type     | Reflector Mirror | List Price<br>Each |
|----------|----------|------------------|--------------------|
| 25024    | DDB-1419 | Golden Glow      | \$62.50            |
| 25028    | DDB-1419 | Crystal          | 62.50              |



## FLOOD LIGHTING PROJECTORS

Golden Glow or Crystal Mirror

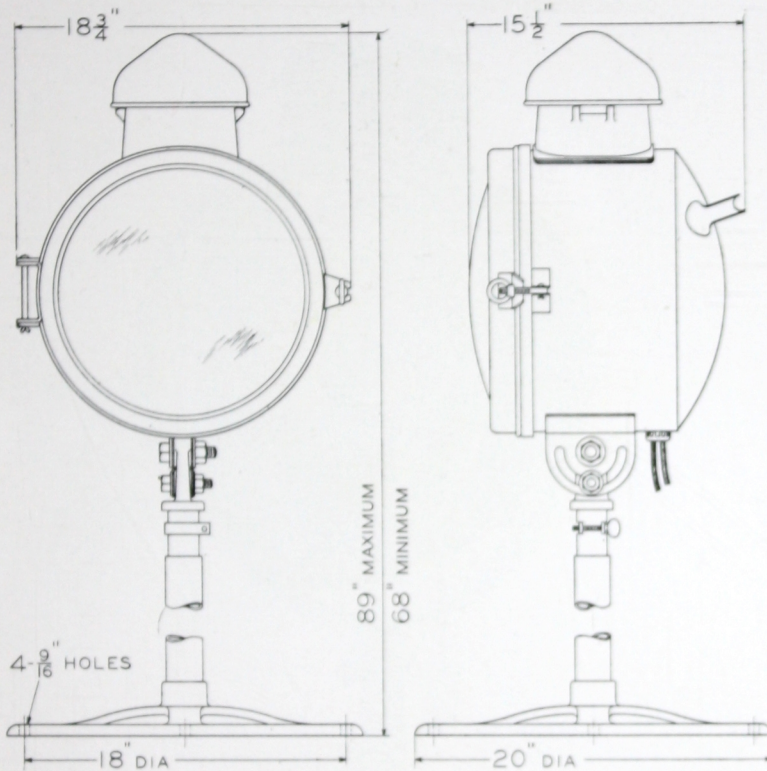


Type PFL-1419



## FLOOD LIGHTING PROJECTORS

Golden Glow or Crystal Mirror



Dimension Diagram

The type PFL-1419 flood-light is identical in construction with the FL-1419 unit described on page 12, except that it is mounted on a pipe standard, thus adapting it for portable service.

These flood-lights are fitted with a 14-inch Golden Glow or Crystal mirrored glass reflector and a Mogul socket adapted to use standard 750, 1000 or 1500 watt lamps, and are equipped with a focusing device by which the filament may be adjusted to give the desired light distribution and securely locked in position.

The front of the light is regularly equipped with a curved special heat resisting glass, approximately  $\frac{1}{4}$  inch thick, moulded to the desired shape. This glass being subjected to two annealing operations to thoroughly remove all strains that might be present, results in the practical elimination of glass breakage and consequent reduction in maintenance cost.

The weight complete is approximately 92 pounds.

The characteristic curves showing the performance of this type flood-light are shown by Figures 1, 2, 3, 4 and 5, on pages 23, 24, 25 and 26.

The following list prices do not include incandescent lamps, which are listed on page 22.

List No.  
20525  
20528

Type  
PFL-1419  
PFL-1419

Reflector Mirror  
Golden Glow  
Crystal

List Price  
Each  
\$62.50  
62.50



---

ELECTRIC SERVICE SUPPLIES COMPANY

---

## FLOOD LIGHTING PROJECTORS

Golden Glow or Crystal Mirror

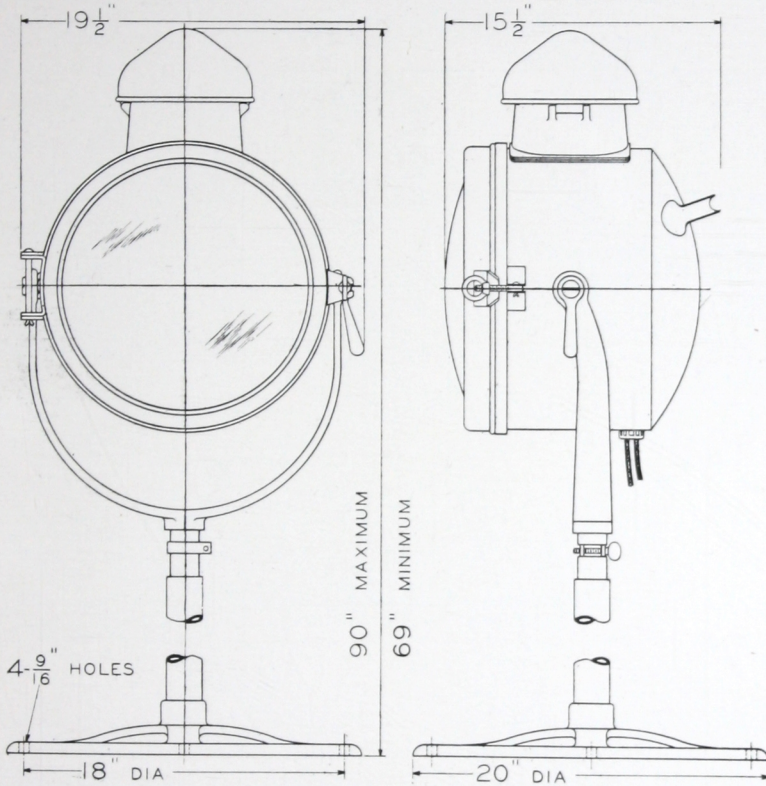


Type PDB-1419



## FLOOD LIGHTING PROJECTORS

Golden Glow or Crystal Mirror



Dimension Diagram

The type PDB-1419 flood-light is identical in construction with the DDB-1419 unit described on page 16, except that it is mounted on a pipe standard, thus adapting it for portable service.

The type PDB-1419 projector is equipped with 14-inch diameter Golden Glow or Crystal Mirror glass reflector and Mogul socket, arranged with Universal focusing device by which means the filament of the lamp may be brought to the focal centre of the reflector and securely locked. They are adapted for use with 750, 1000 or 1500 watt type C Mazda lamps.

The front of the light is regularly equipped with a curved special heat resisting glass, approximately  $\frac{1}{4}$  inch thick, moulded to the desired shape. This glass being subjected to two annealing operations to thoroughly remove all strains that might be present, results in the practical elimination of glass breakage and consequent reduction in maintenance cost.

The weight complete is approximately 95 pounds.

The characteristic curves showing the performance of this type flood-light are shown by Figures 1, 2, 3, 4 and 5, on pages 23, 24, 25 and 26.

Prices do not include incandescent lamps which are listed separately on page 22.

List No.  
20613  
20616

Type  
PDB-1419  
PDB-1419

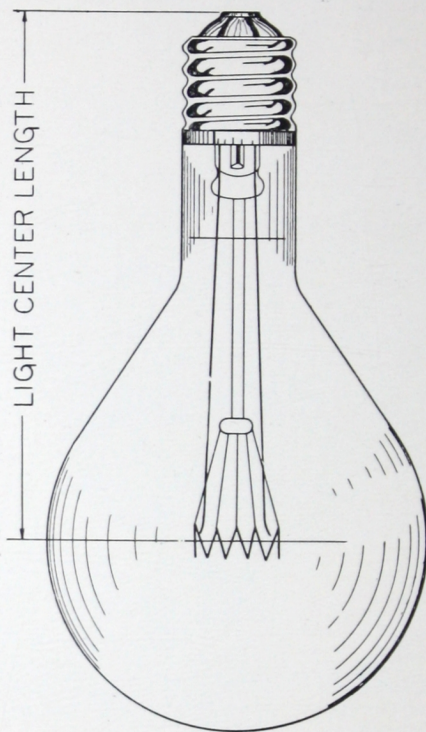
Reflector Mirror  
Golden Glow  
Crystal

List Price  
Each  
\$70.00  
70.00



## INCANDESCENT PROJECTOR LAMPS

For Type 1419 Projectors



Mazda C lamps listed below are applicable for use with type 1419 Golden Glow or Crystal Mirror projectors having 14-inch diameter reflectors arranged for mounting a lamp in a vertical position.

These lamps have concentrated filaments, pear-shaped bulbs and are fitted with bases to fit Mogul sockets.

In ordering specify exact voltage required, otherwise 115 volt lamps will be supplied in the 110-125 volt range or 220 volt lamps in the 200-260 volt range. Lamps of voltages of 100 to 109, 126 to 130, 200 to 219 or 251 to 260 are considered special, but will be supplied at the same prices.

| List No. | Total<br>Watts | Voltage | Style Bulb | Light<br>Centre<br>Length | Standard<br>Package | List<br>Price<br>Each |
|----------|----------------|---------|------------|---------------------------|---------------------|-----------------------|
| 22514    | 500            | 100-130 | PS-40      | 7 in.                     | 12                  | \$2.00                |
| 22522    | 500            | 200-260 | PS-40      | 7 "                       | 12                  | 2.40                  |
| 44917    | 750            | 100-130 | PS-52      | 9½ "                      | 8                   | 3.50                  |
| 44929    | 750            | 200-260 | PS-52      | 9½ "                      | 8                   | 4.00                  |
| 44919    | 1000           | 100-130 | PS-52      | 9½ "                      | 8                   | 3.75                  |
| 23375    | 1000*          | 110-130 | PS-52      | 9½ "                      | 8                   | 4.00                  |
| 44931    | 1000           | 200-260 | PS-52      | 9½ "                      | 8                   | 4.50                  |
| 20573    | 1500           | 100-130 | PS-52      | 9½ "                      | 8                   | 5.00                  |
| 20574    | 1500           | 200-260 | PS-52      | 9½ "                      | 8                   | 6.75                  |

\* Specially concentrated flood-light lamp.



## FLOOD LIGHT PERFORMANCE CURVES

## Golden Glow Mirror

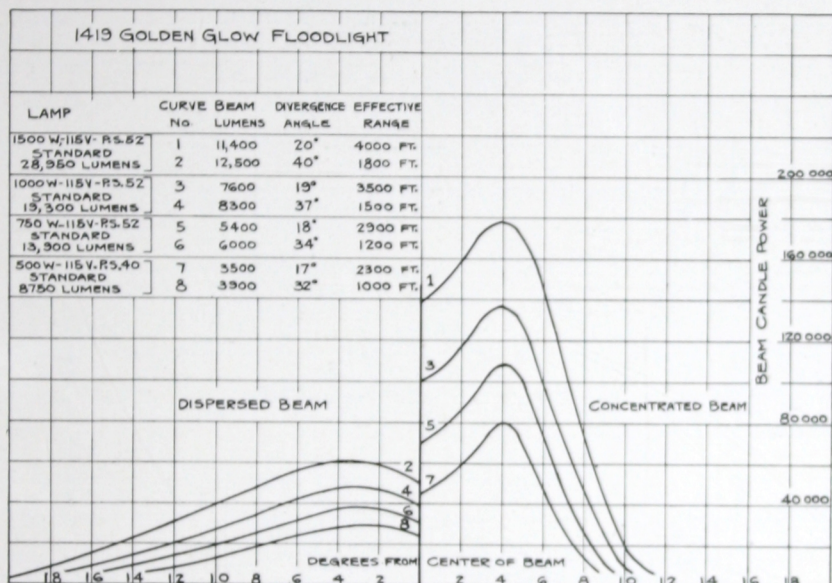


Figure 1

Fig. 1 shows the light distribution curves for the 1419 Golden Glow flood-lights with standard general lighting service lamps from 500 watts to 1500 watts inclusive. The light distribution curves are drawn to show the distributions of maximum concentration and maximum divergence, and are indicated by the curves as "Concentrated Beam" and "Dispersed Beam" respectively. Any light distribution desired within the limits defined by these two curves may be obtained by proper adjustment of the lamp filament with respect to the focal point of the reflector, without requiring the use of dispersing lenses of any sort.

The curves of Fig. 1 are numbered and the general characteristics of the flood-light using each lamp are given in tabular form. The values of "Beam Lumens" and "Divergence Angle" given, are referred to the point on the curves where the beam intensity is 10 per cent. of its maximum value. The values for effective range are largely derived from practical experience in the flood-light field and represent the maximum distance at which the flood-light will provide useful illumination when applied in accordance with present engineering practice.



## FLOOD LIGHT PERFORMANCE CURVES

## Golden Glow Mirror

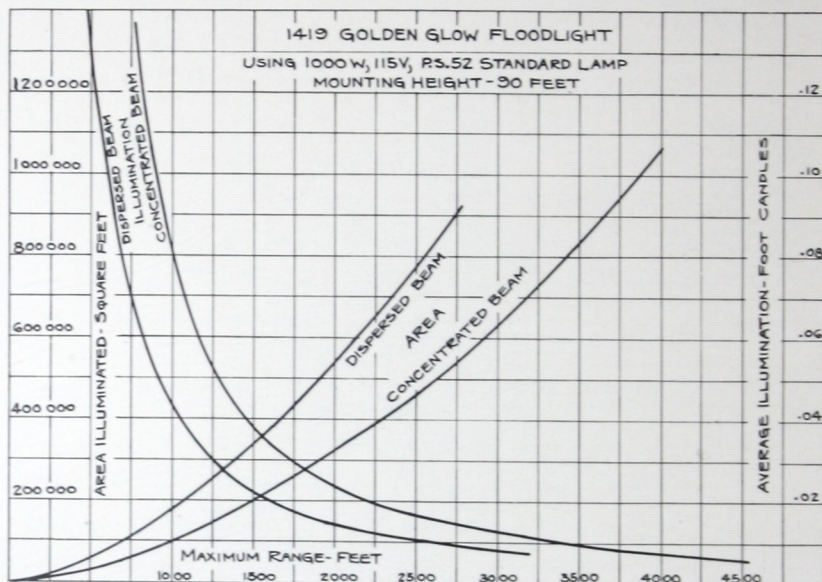


Figure 2

Figure 2 shows the "Average Illumination" and "Area" curves for the 1419 Golden Glow flood-light when used with the 1000 watt, 115 volt general lighting service lamp. The curves for "Concentrated" and "Dispersed" beam correspond to the light distribution curves so designated in Fig. 1, and show the minimum and maximum areas respectively that may be covered by a single flood-light at various distances using a mounting height of 90 feet. The values indicated as maximum range are measured from the base of the tower or mounting structure to the point where the upper edge of the beam reaches the ground.

The "Illumination" curves show the average illumination over the area covered by the flood-light. The values for "Concentrated" and "Dispersed" beam correspond to those for the "Area" and "Light Distribution" curves described above.



## FLOOD LIGHT PERFORMANCE CURVES

## Golden Glow Mirror

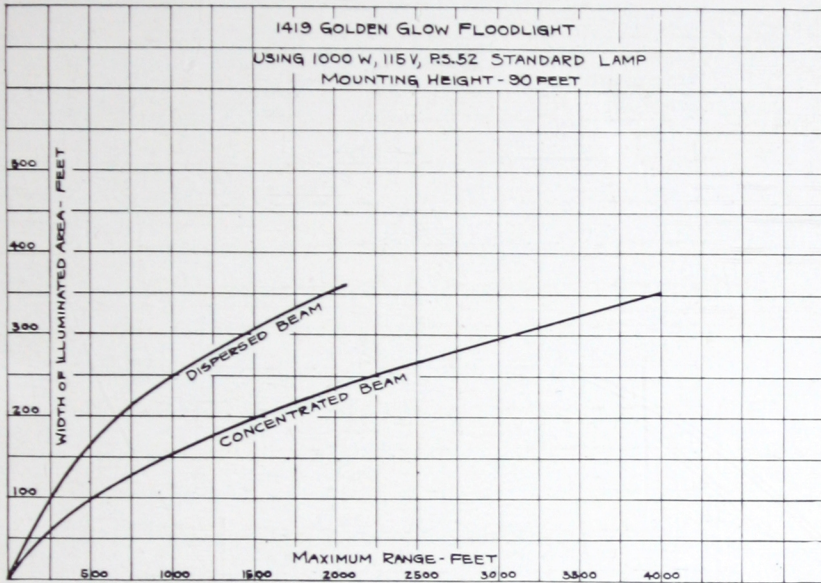


Figure 3

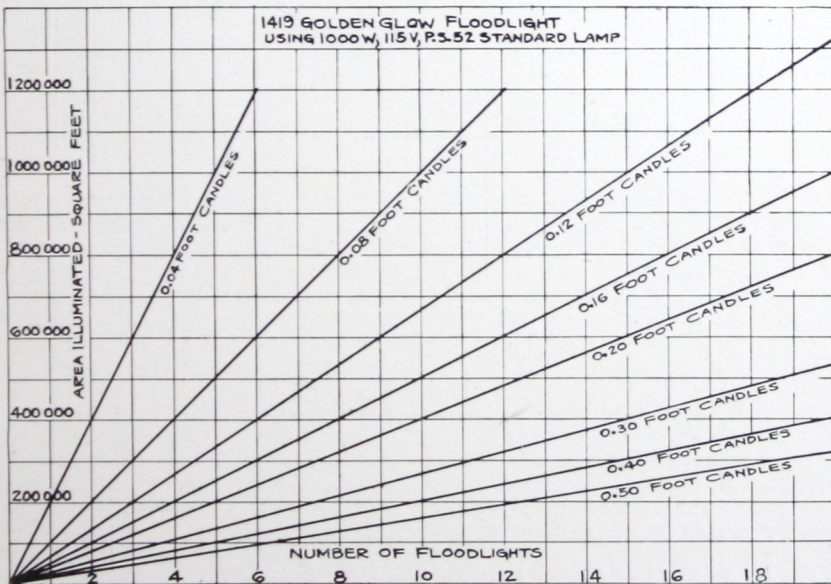


Figure 4



## FLOOD LIGHT PERFORMANCE CURVES

### Golden Glow Mirror

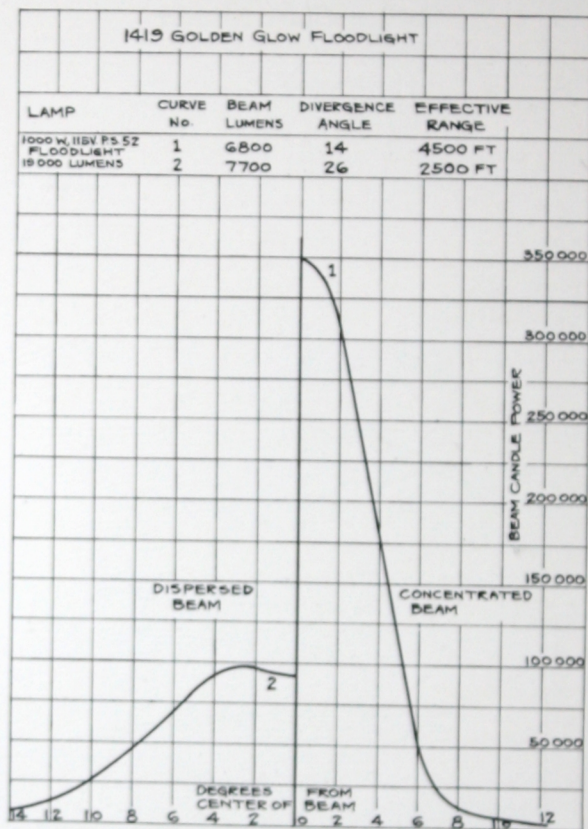


Figure 5

Fig. 3 shows the maximum width of the area illuminated by a single flood-light for various ranges. The area illuminated by the beam from a flood-light mounted 90 feet above the ground, is elliptical and has its greatest width at the centre of the area illuminated. It should be noted that the extremes of the beam referred to above are not sharply defined, the illumination fading out rather slowly. The edge of the beam for calculation purposes is defined as that point in the beam where the candle-power value is 10 per cent. of the maximum. The curves for "Width of Illuminated Area" in Fig. 3 show the range of beam width that may be obtained at various ranges with proper lamp adjustment, without requiring the use of dispersing lenses of any kind.

Fig. 4 shows the number of flood-lights required to illuminate areas of the size ordinarily found in railroad yard flood-lighting to various intensities within the range of present practice. These values, as well as those of Figs. 2 and 3, are based upon the use of the 1000 watt standard lighting service lamp with the 1419 Golden Glow reflector. The curves given in Figs. 2 and 3 are approximately correct for any of the lamps shown in the curves of Fig. 1. The number of flood-lights required to illuminate a given area, shown by Fig. 4 should be modified if lamps other than the 1000 watt lamps are to be used. A ratio as indicated by the values for beam lumens in Fig. 1 should



## FLOOD LIGHT PERFORMANCE CURVES

## Golden Glow Mirror

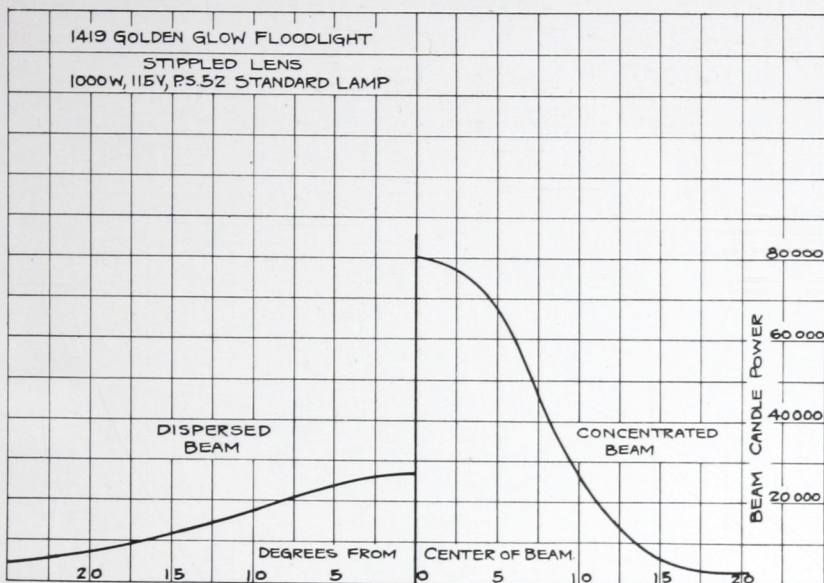


Figure 6

be used. The values for this ratio, expressed as multiplying factors, are 0.66 for the 1500 watt lamp, 1.4 for the 750 watt lamp, and 2.2 for the 500 watt lamp.

The light distribution curves shown in Figure 5 indicate the performance of the FL-1419 flood-light when used with the 1000 watt 115 volt PS-52 flood-lighting lamp, which has a specially concentrated filament. Comparing this curve with those shown for the 1000 watt lamp in Figure 1, it will be noted that the candlepower values are considerably higher and the beam divergence angle is considerably smaller than those for the standard lighting service lamps.

Curves showing illumination values and areas covered for this type lamp are not given. It should be noted that values for the beam width, and areas covered may be approximated readily by using the average of the values read from curves for the 1419 unit with the 1000 watt lamp and the 1412 unit with the 500 watt lamp shown by Figures 2, 3, 7 and 8.

The number of flood-lights required to illuminate a given area, shown by Figure 4, is approximately 10 per cent. low for this lamp, and a multiplying factor of 1.1 should be used for the number of flood-lights required.

Figures Nos. 6, 7 and 8 show the distribution curves for the 1419 Golden Glow flood-light using various types of dispersing lenses. These lenses are useful where a flood-light is required to operate at a comparatively short range and where beam spreads are desired that are larger than can be obtained by displacing the lamp from the focal point of the reflector. These lenses are also useful in providing a smooth and uniform illumination. It may be noted that beam candlepower values are reduced considerably and that much larger areas are covered. These lenses are available upon request, and, inasmuch as they are used only under special conditions, no listing is shown. We will be pleased to supply information and prices upon request to cover any desired conditions.



## FLOOD LIGHT PERFORMANCE CURVES

## Golden Glow Mirror

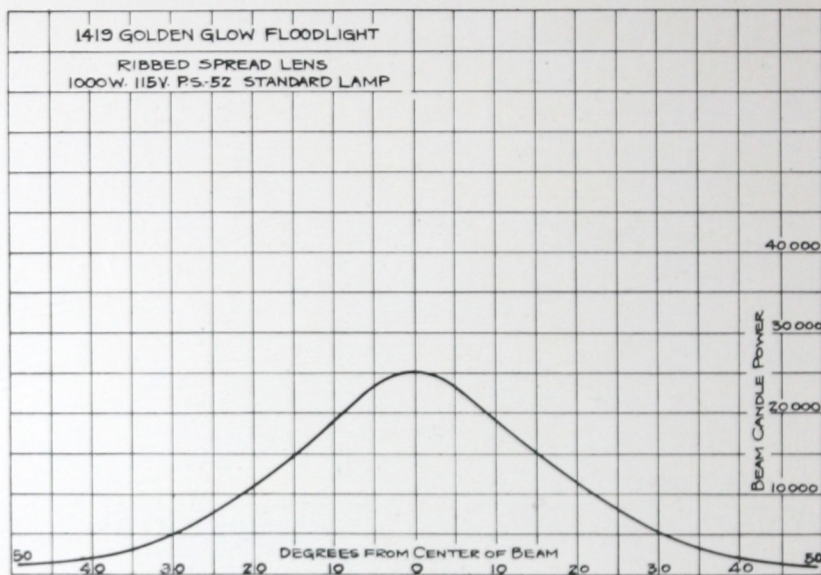


Figure 7

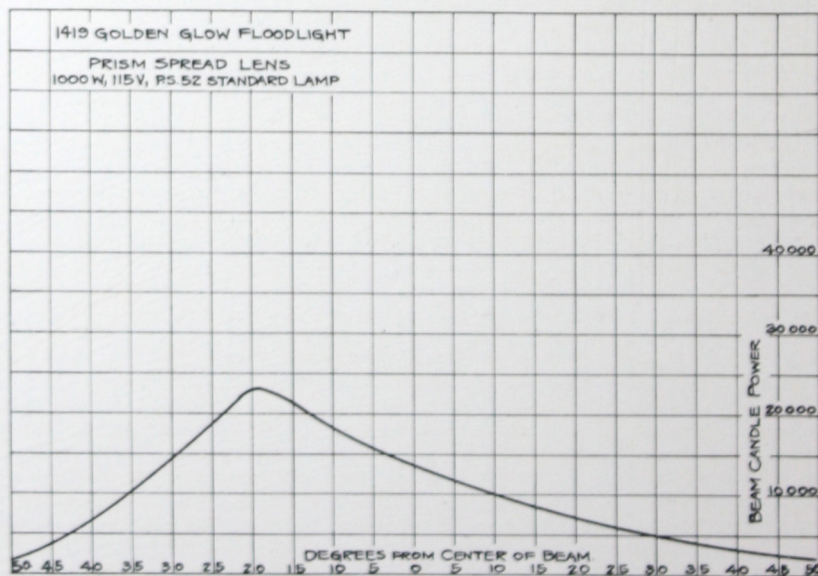


Figure 8



## FLOOD LIGHTING PROJECTORS

Golden Glow or Crystal Mirror



Type FL-1412

The type FL-1412 flood-light projector embodies a reflector and housing that possesses great utility in the flood-lighting field. This projector used with a suitable lamp, develops quite large candlepower values, and is suitable for long-range flood-lighting or moderate range searchlight work. The reflectors used are of unusual optical accuracy and a minimum of beam divergence results.

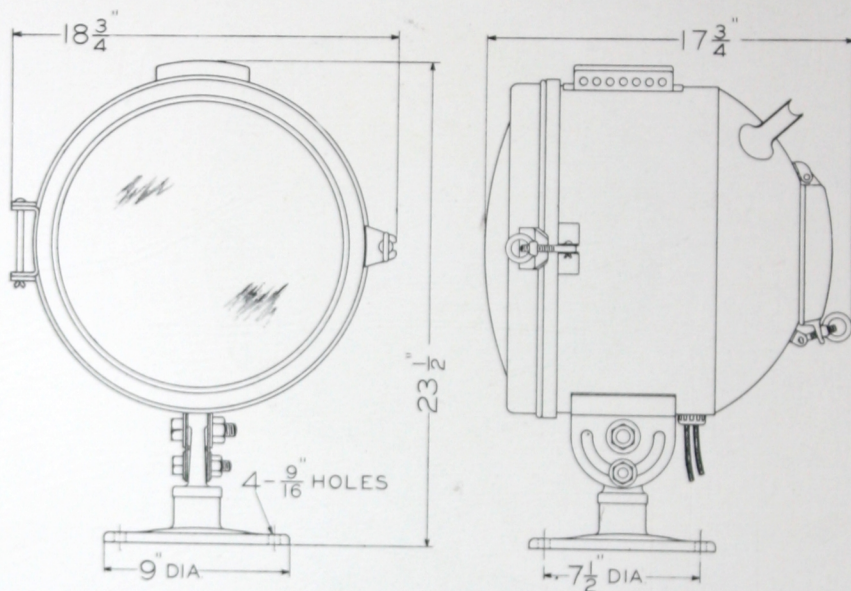
The body proper, including ventilator housing and door, is made of lead coated sheet steel, spot-welded, providing a strong, rigid and weatherproof construction. The door is swung on heavy pressed steel hinges, is fitted with an impregnated jute gasket to assure its being thoroughly weathertight and is held securely closed by our standard wing nut latch construction. These units are regularly equipped with moulded, heat resisting curved front glass so gasketed in the door as to be thoroughly weatherproof.

Suitable ventilation is provided to avoid excessive operating temperatures. The focusing device enabling adjustment in all directions is mounted on a pressed steel shell in which the reflector is mounted, and is inside the flood-light case proper; access is had through a hand hole in the back of the case, closed by a hinged cast cover. The flood-light is mounted from two pressed steel quadrant supports engaging a cast swiveling base, providing both vertical and horizontal adjustments, following which the flood-light may be securely locked in position.



## FLOOD LIGHTING PROJECTORS

Golden Glow or Crystal Mirror



Dimension Diagram

This flood-light is generally used with a 500 watt flood-lighting lamp in G-40 bulb in  $4\frac{1}{4}$  inch l. c. l., a Mogul socket being used. If lamps having other dimensions are to be used, suitable arrangements may be provided.

The front of the light is regularly equipped with a curved special heat resisting glass, approximately  $\frac{1}{4}$  inch thick, moulded to the desired shape. This glass being subjected to two annealing operations to thoroughly remove all strains that might be present, results in the practical elimination of glass breakage and consequent reduction in maintenance cost.

The unit is equipped with a 14-inch Golden Glow or Crystal Mirror reflector of unusual optical accuracy and is especially suited for illumination where long ranges and a powerful beam are required.

The weight is approximately 52 pounds.

The characteristic curves showing the performance of this type flood-light are shown by Figures 9, 10, 11, 12 and 13, on pages 35, 36, 37 and 38.

Prices do not include incandescent lamps, which are listed on page 34.

| List No. | Type    | Reflector Mirror | List Price Each |
|----------|---------|------------------|-----------------|
| 20342    | FL-1412 | Golden Glow      | \$50.00         |
| 20345    | FL-1412 | Crystal          | 50.00           |



## FLOOD LIGHTING PROJECTORS

Golden Glow or Crystal Mirror



Type DDB-1412

The type DDB-1412 flood-light projector is used not only for flood-lighting, but also as harbor lights, marine searchlights, beacon lights and other purposes requiring powerful illumination from a quickly and easily controlled source.

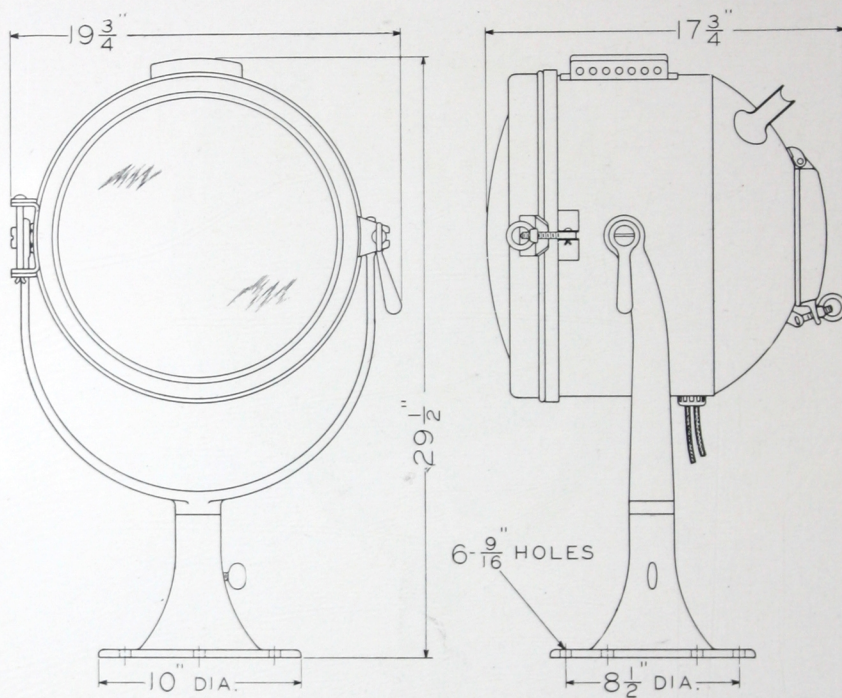
This unit is identical in construction with the type FL-1412, described on page 29, differing only in that the unit is mounted from a heavy malleable iron fork and stand, permitting quick and easy control in both vertical and horizontal planes and which can be securely locked in position.

The projectors are fitted with Mogul sockets and are particularly adapted for use with 500 watt concentrated filament lamps.



## FLOOD LIGHTING PROJECTORS

Golden Glow or Crystal Mirror



Dimension Diagram

The front of the light is regularly equipped with a curved special heat resisting glass, approximately  $\frac{1}{4}$  inch thick, moulded to the desired shape. This glass being subjected to two annealing operations to thoroughly remove all strains that might be present, results in the practical elimination of glass breakage and consequent reduction in maintenance cost.

The weight is approximately 57 pounds.

The characteristic curves showing the performance of this type flood-light are shown by Figures 9, 10, 11, 12 and 13, on pages 35, 36, 37 and 38.

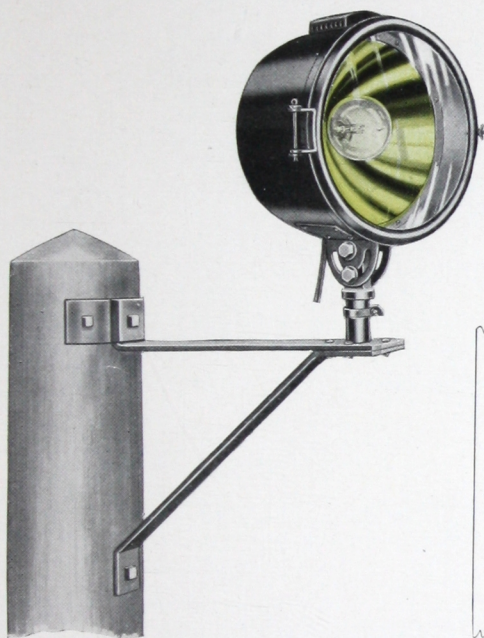
Prices do not include incandescent lamps, which are listed on page 34.

| List No. | Type     | Reflector Mirror | List Price<br>Each |
|----------|----------|------------------|--------------------|
| 20336    | DDB-1412 | Golden Glow      | \$60.00            |
| 20339    | DDB-1412 | Crystal          | 60.00              |

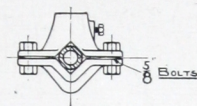


## FLOOD LIGHTING PROJECTORS

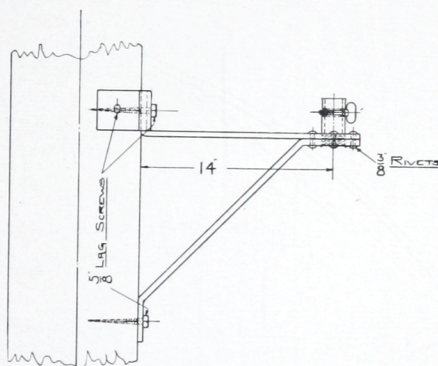
## Projector Supports



Type B Support



Type R Support



These supports afford a convenient method of installing types FL-1412 or FL-1419 projectors on poles, on vertical surfaces or on pipe frame work.

Type B supports consist of two 4 x ½-inch bar iron members, riveted and welded together. The upper or horizontal member is fitted with an iron segment, which partially encircles the pole, resulting in an exceptionally strong and rigid installation.

Type C supports are the same as type B, except that they are intended for mounting on a flat, vertical surface.

Type R supports are designed to allow the projector to be mounted on a horizontal pipe, this method being used where batteries of projectors are installed at one location and mounted on pipe racks.

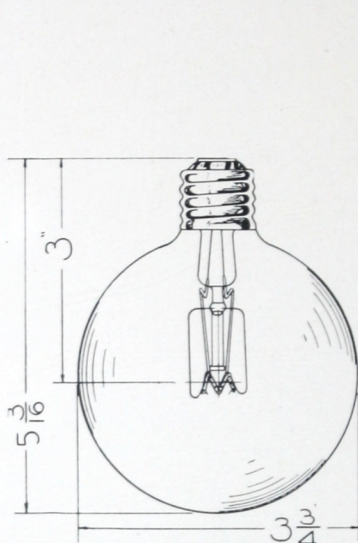
Listing below covers supports only; in arriving at the list prices of projectors fitted with these supports, deduct \$2.20 from the list price of the desired projector and add to the figure so obtained list price given below for the support desired.

| List No. |  | List Price<br>Each |
|----------|--|--------------------|
| 20318    | Type B support for poles .....                   | \$8.00             |
| 20319    | Type C support for walls and flat surfaces ..... | 8.00               |
| 20320    | Type R support for 1½-inch pipe .....            | 3.75               |
| 20321    | Type R support for 1¾-inch pipe .....            | 4.00               |
| 20322    | Type R support for 2-inch pipe .....             | 4.15               |

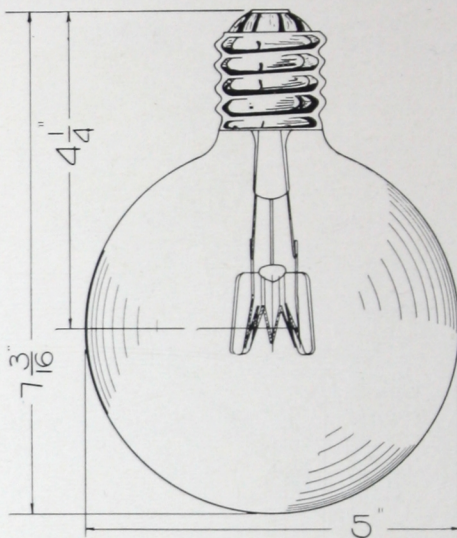


# INCANDESCENT PROJECTOR LAMPS

For Type 1412 Projectors



No. 22132



No. 22133

Mazda C concentrated filament lamps used in connection with type 1412 Golden Glow or Crystal Mirror 14-inch diameter flood-lighting projectors are listed below.

These lamps are supplied in round bulbs for use in a horizontal position.

The 250-watt size is equipped with Edison medium screw base and the 500-watt size with Mogul base.

Flood-lighting projectors are regularly supplied with Mogul sockets, hence to use 250-watt lamps (which have medium screw base), a socket adapter is required.

In ordering specify exact voltage, otherwise 115 volt lamps will be supplied.

Lamps of voltages of 100 to 109 and 126 to 130 are considered special, but will be supplied at the same price.

| List No. | Total Watts                             | Voltage | Style Bulb | Light Centre Length | Standard Package | List Price Each |
|----------|---|---------|------------|---------------------|------------------|-----------------|
| 22132    | 250*                                    | 100-130 | G-30       | 3 in.               | 24               | \$2.25          |
| 22133    | 500                                     | 100-130 | G-40       | 4 1/4 "             | 12               | 3.25            |
| 44716    | Socket adapter for Mogul to medium base |         |            |                     | 100              | .35             |

## Lamps for Special Conditions

| List No. | Total Watts | Voltage | Style Bulb | Light Centre Length | Maximum Reflector Diameter | Standard Package | List Price Each |
|----------|-------------|---------|------------|---------------------|----------------------------|------------------|-----------------|
| 19636    | 108         | 6       | G-30       | 3 1/2 in.           | 14 in.                     | 24               | \$1.70          |
| 20947    | 100*        | 32      | G-25       | 3 "                 | 14 "                       | 60               | 1.00            |
| 20949    | 250*        | 32      | G-30       | 3 "                 | 14 "                       | 24               | 1.75            |
| 22133    | 500         | 115     | G-40       | 4 1/4 "             | 14 "                       | 12               | 3.25            |
| 23359    | 1000        | 115     | G-40       | 4 1/4 "             | 14 "                       | 12               | 6.00            |

\* These lamps fitted with Medium screw base.



## FLOOD LIGHT PERFORMANCE CURVES

## Golden Glow Mirror

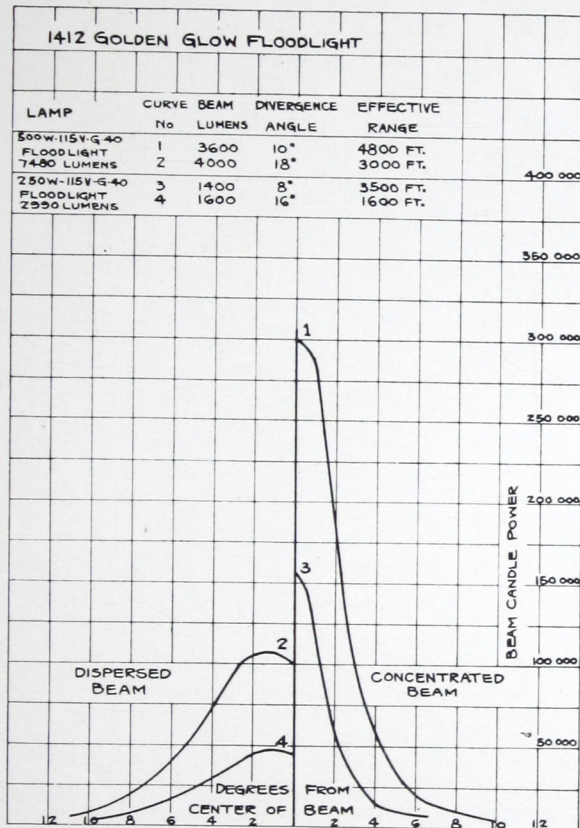


Figure 9

Fig. 9 shows the characteristic light distribution curves for the 1412 Golden Glow flood-lights using the standard G-bulb flood-lighting lamps in the 500 and 250 watt, 115 volt class. A considerable range of adjustment is provided in the focusing device for controlling beam spread. The curves designated as "Concentrated Beam" show the distribution with the lamp adjusted to produce a beam having the minimum divergence. The "Dispersed Beam" curves show the beam characteristics with the lamp adjusted to produce the maximum divergence that can be obtained without the use of dispersing lenses.



## FLOOD LIGHT PERFORMANCE CURVES

## Golden Glow Mirror

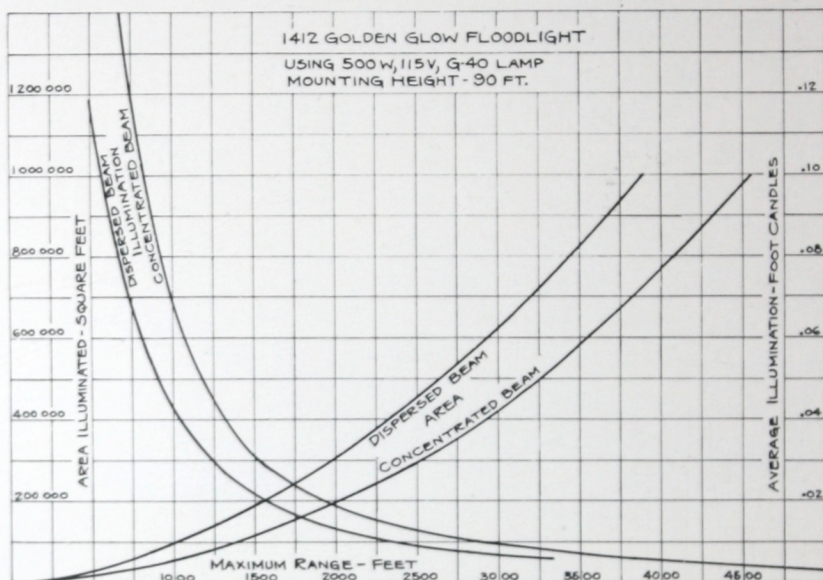


Figure 10

Fig. 10 shows the areas covered and the corresponding illumination values when the 500 watt lamp is used and the flood-light mounted at a height of 90 feet above the ground. These curves are applicable to most industrial applications where relatively large areas are to be lighted. The area and illumination curves are drawn for both "Concentrated" and "Dispersed" beam and correspond to the light distribution curves similarly designated.

Fig. 11 shows the maximum width of the illuminated area at various ranges over which the flood-light will produce effective illumination. The area illuminated by this flood-light with the lamp and mounting height noted, is elliptical and the values indicated by the curves are those corresponding to the centre of the area illuminated by the flood-light beam. Curves of beam width are shown for both "Concentrated" and "Dispersed" beam corresponding to the light distribution curves similarly designated.

It should be noted that any desired values for beam width, area covered and average illumination between the limits shown by the "Concentrated" and "Dispersed" beam curves may be obtained by proper location of the lamp filament with respect to the focal point of the reflector.

Fig. 12 shows the number of flood-lights required to illuminate a given area to a desired intensity and covers the usual working range of this type of flood-light. The relations shown apply to the 500 watt, 115 volt standard flood-lighting lamp. If the 250 watt lamp is to be used, the values for the number of flood-lights required should be multiplied by 2.5.



## FLOOD LIGHT PERFORMANCE CURVES

## Golden Glow Mirror

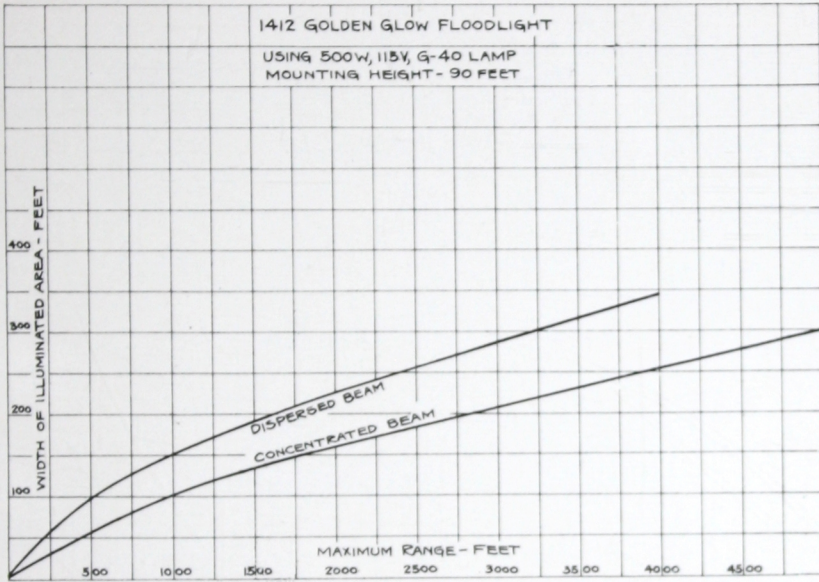


Figure 11

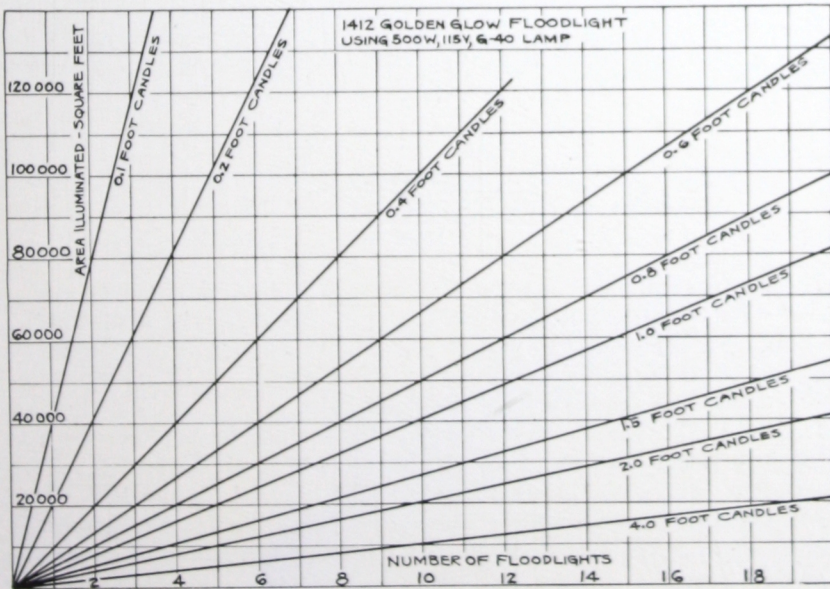


Figure 12



## FLOOD LIGHT PERFORMANCE CURVES

## Golden Glow Mirror

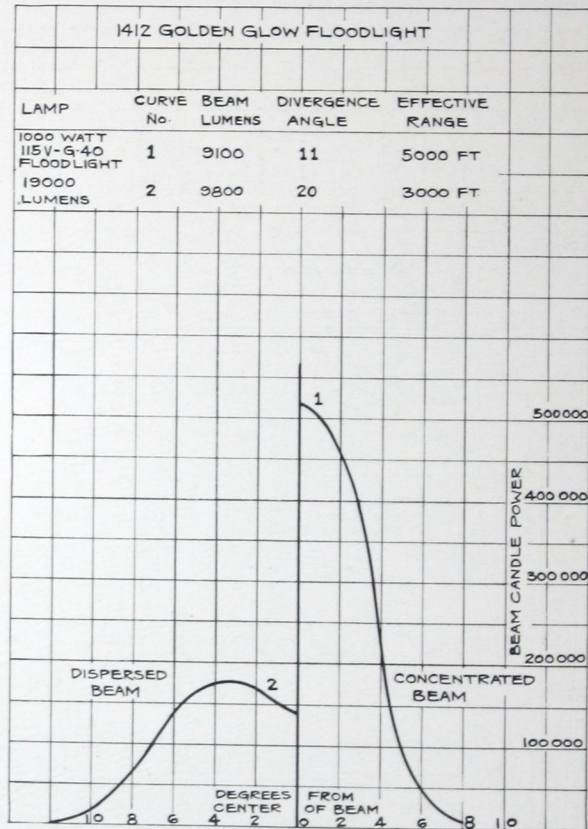


Figure 13

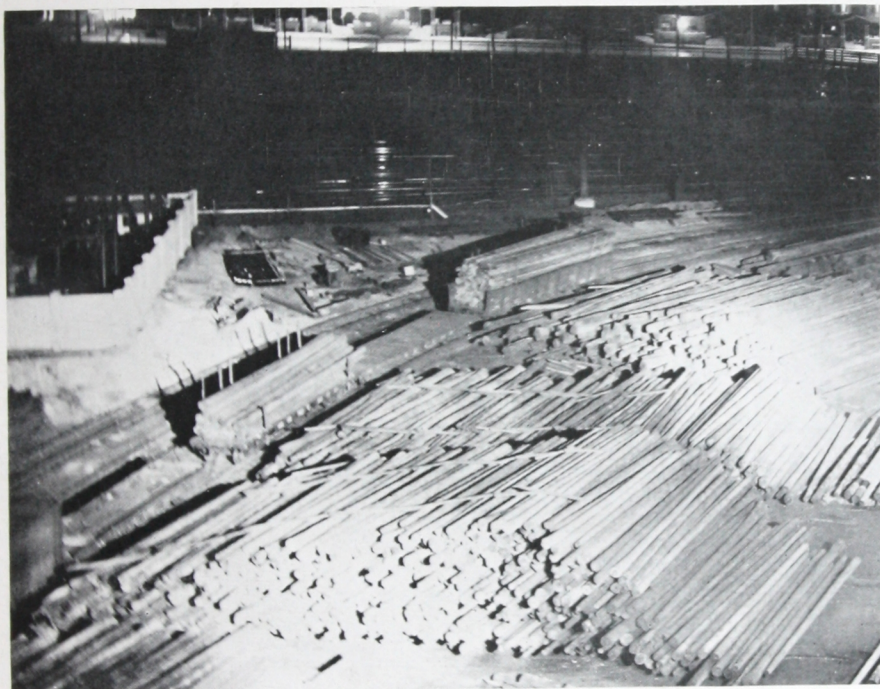
The distribution curve shown by Figure 13 is that obtained by the use of the 1000 watt 115 volt G-40 flood-light lamp in the 1412 type flood-light. This flood-light and lamp combination is particularly applicable to certain classes of lighting requiring high intensities, extreme ranges, or in cases where high overall efficiency is required from the flood-light.

The light distribution curves for this lamp show beam divergence angles only slightly larger than those for the 500 watt lamp shown in Figure 6. The characteristic curves of Figures 10 and 11 may be used for the 1000 watt lamp without introducing appreciable errors, except that illumination intensities will be higher than shown by Figure 10, and a multiplying factor of approximately 2.5 should be used.



## FLOOD LIGHTING PROJECTORS

Golden Glow or Crystal Mirror



The illumination shown by this photograph was produced by two FL-1412 flood-lights equipped with 500 watt, 115 volt, G-40 flood-lighting lamps. Illumination of this character is an effective aid in protecting property and improving the morale of policing forces and increasing their effectiveness. Flood-lighting is used to great advantage in construction work; excavations for buildings often require a twenty-four-hour working schedule,—flood-lighting is the only satisfactory means for providing adequate light in the working areas.

Factory yards and storage areas that are in use during the darkness hours can be lighted more economically and more satisfactorily with flood-lights than with any other type of lighting system that can be installed.



## FLOOD LIGHTING PROJECTORS

Golden Glow or Crystal Mirror



Type FL-128-P

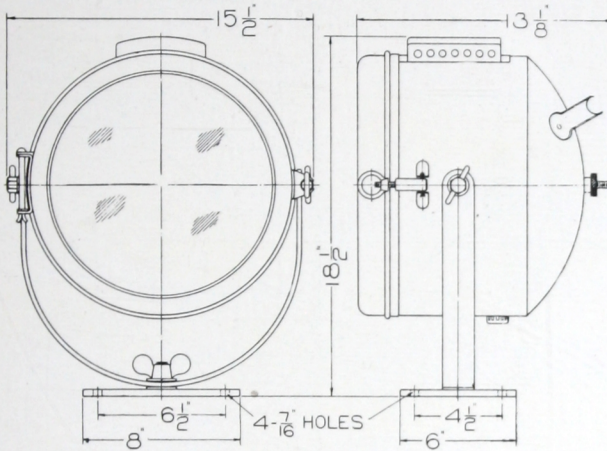
The Type FL 128-P Golden Glow flood-light was developed to meet the need for a moderate sized flood light of high efficiency for use at comparatively short ranges.

This type of flood-light is particularly effective for the illumination of buildings,—they can be concealed behind cornices or columns and are useful in providing background illumination on the building walls proper that can be arranged to throw columns into relief against the illuminated background. Color schemes can be used and many beautiful combinations and lighting effects obtained therefrom. The prismatic reflector used in the unit provides smooth, uniform illumination, free from filament images and bright spots, and is admirably adapted for use with the short ranges and extremely sharp angles met with in building exterior lighting.



## FLOOD LIGHTING PROJECTORS

## Golden Glow or Crystal Mirror



Dimension Diagram

It is equipped with a special design of prismatic Golden Glow 12-inch diameter reflector and the case is made of heavy gauge, lead-covered sheet steel. A focusing device is provided that will accommodate G-bulb lamps up to 500 watts capacity, in either Mogul or medium screw base.

Adequate ventilation is provided for the larger lamps and the flood-light is mounted on a substantial yoke and base, providing ready adjustment in any desired direction, after which the flood-light may be securely locked in position.

The characteristic curves showing the performance of this type of flood-light are shown by Figures 14, 15, 16 and 17, on pages 43, 44 and 45.

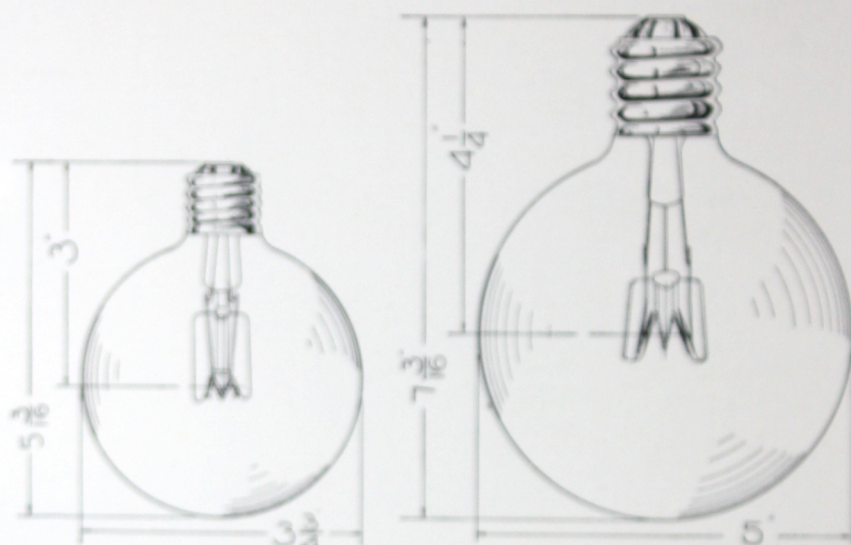
List prices do not include incandescent lamps, which are shown on page 42.

| List No. | Type     | Reflector Mirror | List Price<br>Each |
|----------|----------|------------------|--------------------|
| 23355    | FL 128-P | Golden Glow      | \$37.50            |



## INCANDESCENT PROJECTOR LAMPS

For Type 128 Projectors



Mazda C concentrated filament lamps, suitable for use with type 128 Golden Glow or Crystal flood-light or searchlight projectors are listed below.

These lamps are supplied in round bulb and are to be burned in a horizontal position.

The flood-lights are regularly supplied with medium screw sockets, adapted to the use of lamps having a light center length not exceeding  $2\frac{3}{4}$  inches.

In ordering lamps, specify exact voltage required.

| List No. | Total Watts                             | Voltage | Style Bulb | Light Centre Length | Standard Package | List Price Each |
|----------|---|---------|------------|---------------------|------------------|-----------------|
| 19625    | 94                                      | 115     | G-25       | $2\frac{3}{4}$ in.  | 60               | \$1.55          |
| 19627    | 150                                     | 115     | G-25       | $2\frac{3}{4}$ "    | 60               | 1.70            |
| 19628    | 250                                     | 115     | G-30       | $2\frac{3}{4}$ "    | 60               | 2.35            |
| 22133    | 500                                     | 100-130 | G-40       | $4\frac{1}{4}$ "    | 12               | 3.25            |
| 19629    | 100                                     | 34      | G-25       | $2\frac{3}{4}$ "    | 60               | 2.00            |
| 19631    | 250                                     | 34      | G-30       | $2\frac{3}{4}$ "    | 24               | 4.00            |
| 19634    | 72                                      | 12      | G-25       | $2\frac{3}{4}$ "    | 50               | 2.00            |
| 20190    | 108                                     | 12      | G-30       | $2\frac{3}{4}$ "    | 24               | 2.25            |
| 44716    | Socket adapter for Mogul to medium base |         |            |                     | 100              | .35             |



## FLOOD LIGHT PERFORMANCE CURVES

## Golden Glow Mirror

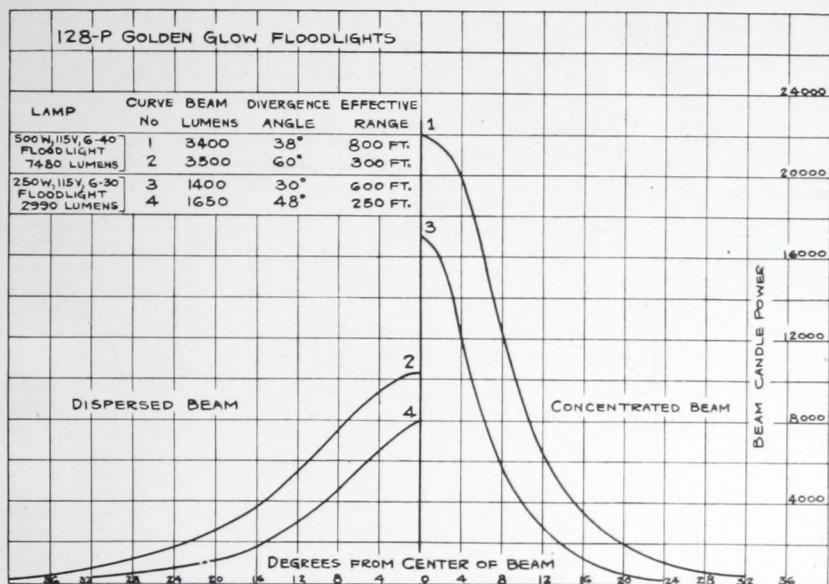


Figure 14

Fig. 14 shows the light distribution characteristics of the 128-P Golden Glow flood-light used with the 500 and 250 watt lamps in the 115 volt G-bulb flood-lighting class. The curves for "Concentrated" and "Dispersed" beam show the light distribution obtained with the lamp adjusted to produce beams having minimum and maximum divergence respectively.

The tabular values for "Effective Range" show the maximum range at which the flood-light may be used successfully. The values for "Beam Lumens" and "Divergence Angle" are referred to the point on the distribution curve where the intensity has a value that is 10 per cent. of the maximum. Owing to the comparatively large beam divergence angles obtained from this type flood-light, and the short ranges at which it is used, there is a very considerable amount of useful light in the beam outside the 10 per cent. point on the curve that is generally used to designate the outside edge of the beam. In consequence, the values for beam lumens and divergence angle are somewhat smaller than the effective values found in practice.



## FLOOD LIGHT PERFORMANCE CURVES

## Golden Glow Mirror

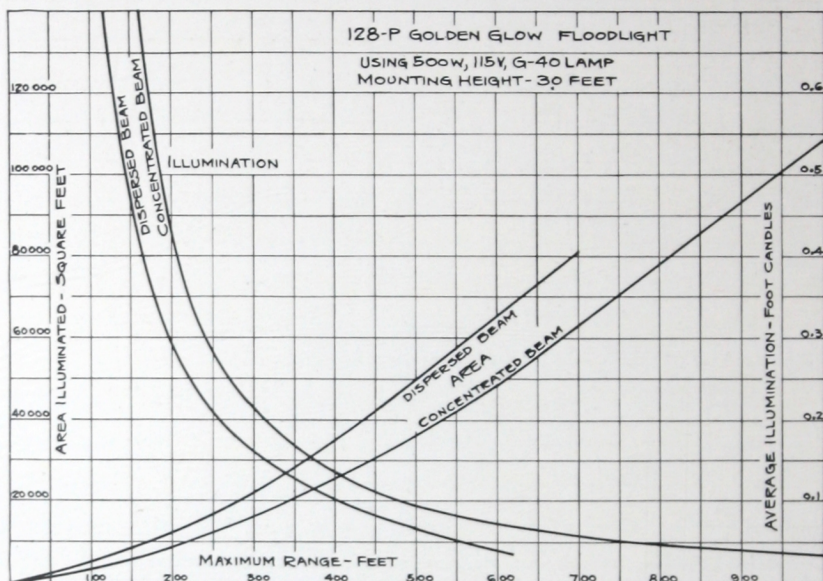


Figure 15

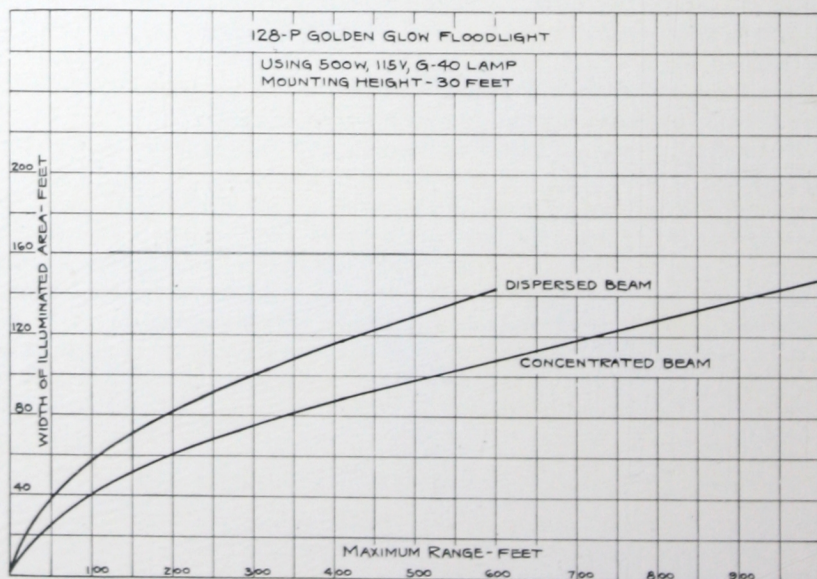


Figure 16



## FLOOD LIGHT PERFORMANCE CURVES

## Golden Glow Mirror

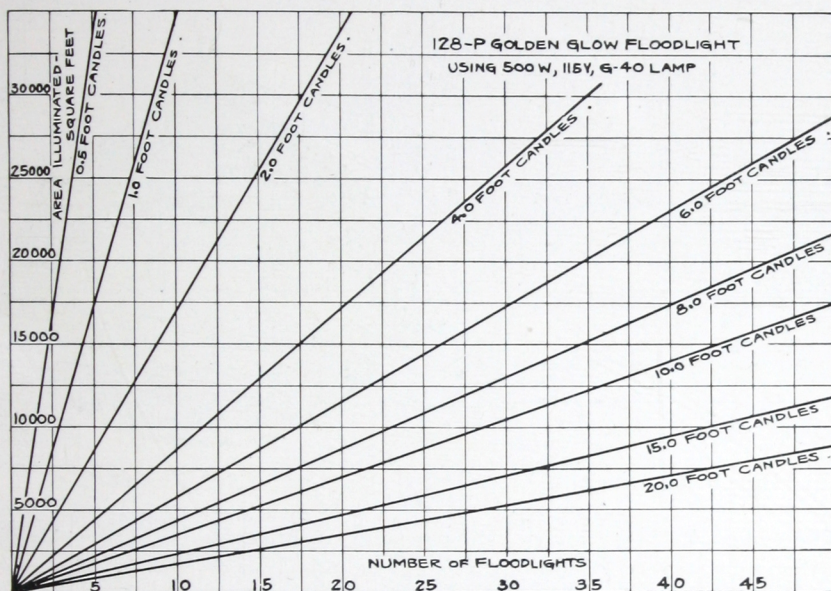


Figure 17

Fig. 15 shows the areas covered and the corresponding average illumination intensities at various ranges within the effective working range for the flood-light when used with the 500 watt, 115 volt, G-40 standard flood-lighting lamp and a mounting height of 30 feet. The curves designated as "Concentrated" and "Dispersed" beam correspond to the light distribution curves of Fig. 14 similarly designated and represent the minimum and maximum areas respectively that can be covered by the flood-light at the various ranges. Any desired distribution within these limits may be obtained by proper location of the lamp filament with respect to the focal point of the reflector.

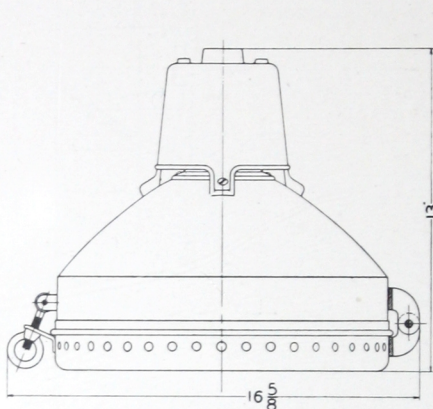
Fig. 16 shows the maximum width of the illuminated area using the 500 watt, 115 volt, G-40 standard flood-lighting lamp in the 128-P flood-light. The area illuminated is elliptical in shape and has its greatest width at the centre of the area illuminated by the beam. The curves of Figs. 15 and 16 correspond to the usual applications of this flood-light in industrial work, in which suitably located poles or buildings are utilized to provide flood-light mounting locations.

Fig. 17 shows the number of flood-lights required to illuminate a given area to a desired intensity. These values apply to the 500 watt lamp. If the 250 watt lamp is used the indicated quantity of flood-lights required should be multiplied by 2.1.



## GOLDEN GLOW LIGHTING FIXTURES

## Pendant Type RC-128-P



Dimension Diagram



Type RC-128-P

The type RC-128-P Golden Glow pendant lighting unit was developed to meet the more severe conditions arising in industrial lighting. The unit is designed to accommodate Type C lamps from 200 to 500 watts, in the 110 and 220 volt multiple burning class using P. S. bulb with medium or Mogul socket. The special prismatic reflector is of Golden Glow glass, and provides an effective field of illumination of approximately 75 degrees, delivering soft, non-glaring light having the quality of greater penetration in atmosphere of fog, smoke, dust and moisture, than can be obtained with a white light.

This unit is particularly suited for lighting coal piers, railroad erecting shops and roundhouses, steel mills, foundries, loading and storage yards, car barns, thorofares, street intersections, traffic officers and signs, and application of a similar nature.

The units are constructed of heavy gauge rust-resisting sheet steel, lead coated. Ventilation is provided, and provision made for support from standard 3/4-inch conduit or iron pipe. The unit complete weighs approximately 25 pounds. Price does not include incandescent lamp.

The characteristic curves showing the performance of this type flood-light are shown by Figures 18, 19, 20, 21 and 22, on pages 48, 49, 50 and 51.

List No.

List Price  
Each

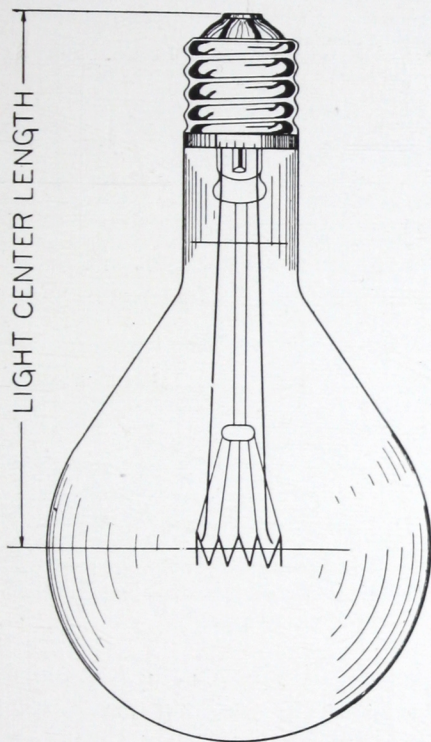
25635    Type RC-128-P Golden Glow pendant lighting fixture, 12-inch  
   diameter reflector .....

\$30.00



## INCANDESCENT PROJECTOR LAMPS

For Type 128-P Projectors



Mazda C lamps listed below are applicable for use with flood-lights using the type 128-P reflector. The lamps are standard multiple burning, in pear-shaped bulb, with medium screw or Mogul bases as noted.

In ordering, specify exact voltage of circuit on which the lamps are to be burned.

| List No. | Total Watts | Voltage | Style Bulb | Light Centre Length | Style Base | Standard Package | List Price Each |
|----------|-------------|---------|------------|---------------------|------------|------------------|-----------------|
| 44909    | 200         | 115     | PS-30      | 6 in.               | Med. Sc.   | 24               | \$ .80          |
| 23356    | 300         | 115     | PS-35      | 7 "                 | Mogul      | 24               | 1.50            |
| 22514    | 500         | 115     | PS-40      | 7 "                 | Mogul      | 12               | 2.00            |



## FLOOD LIGHT PERFORMANCE CURVES

## Golden Glow Mirror

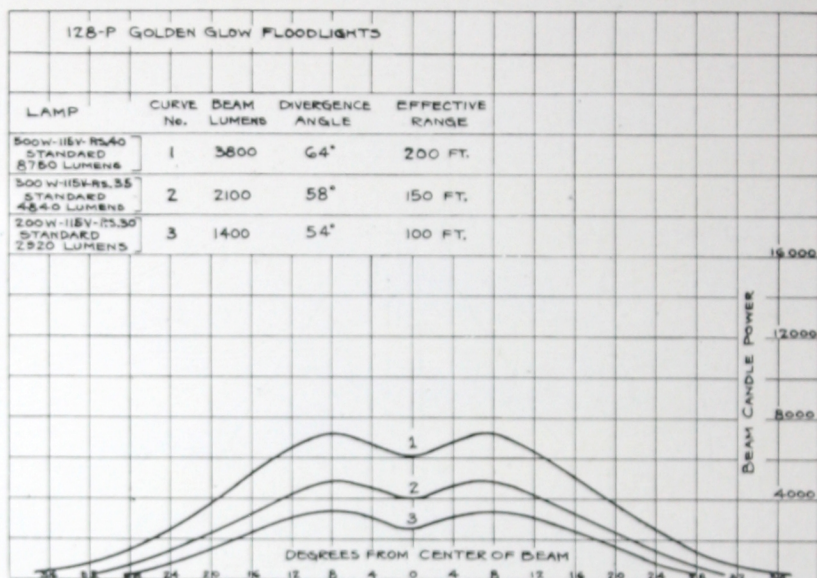


Figure 18

Fig. 18 shows the characteristic light distribution curves obtained from the 128-P Golden Glow flood-light using 200, 300 and 500 watt, PS-bulb standard lighting service lamps in the 115 volt class. This type of flood-light is built as a pendant unit and is useful for lighting around coal wharves, loading docks and high-bay factory lighting. The values for effective range are approximately the largest values that are ordinarily encountered in practice. The values for beam lumens and divergence angle are referred to the point on the beam where the light intensity has fallen to a value that is 10 per cent. of the maximum value. Owing to the large values for divergence angle and the short ranges at which this unit is ordinarily used, there is a relatively large amount of useful light outside the limits for the beam as defined by the 10 per cent. point noted above. Focal adjustment is unnecessary.



# FLOOD LIGHT PERFORMANCE CURVES

## Golden Glow Mirror

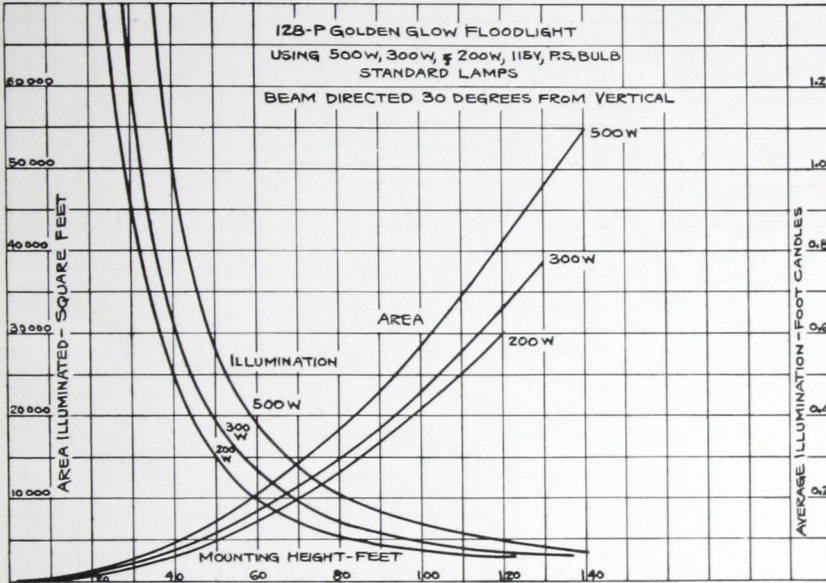


Figure 19

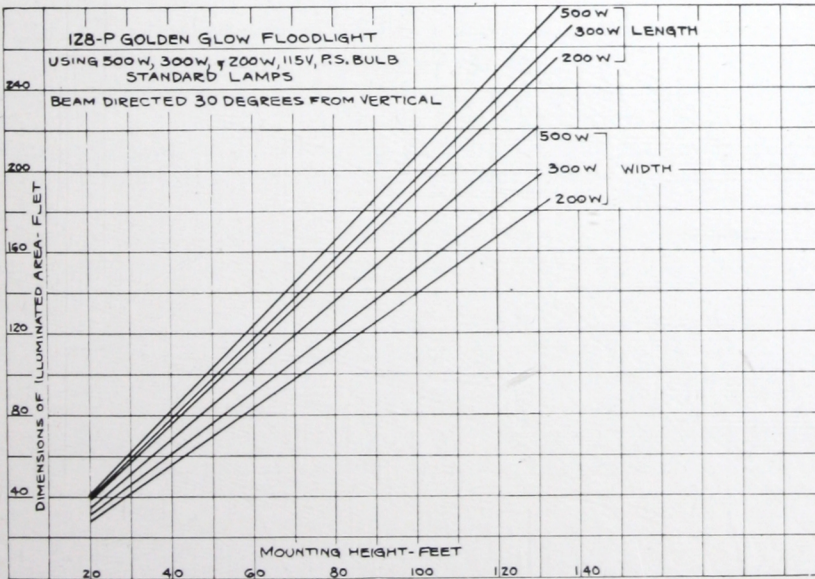


Figure 20



## FLOOD LIGHT PERFORMANCE CURVES

## Golden Glow Mirror

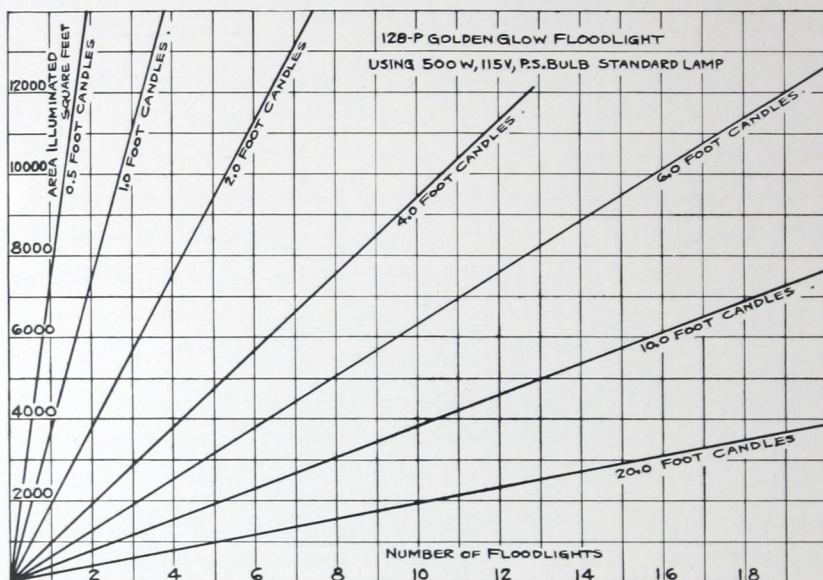


Figure 21

Figure 19 shows the areas covered and the corresponding average illumination values for the 200, 300 and 500 watt lamps. These curves are referred to the mounting height for the unit and are based on the unit being directed at an angle of 30 degrees from the vertical.

Fig. 20 shows the values for length and width of the area illuminated at the various mounting heights with the flood-light unit directed at an angle of 30 degrees from the vertical.

If the flood-light beam is directed vertically downward, the area illuminated will be circular, and the values for diameter of this area at various mounting heights may be read from the curves showing width of the illuminated area, without introducing an appreciable error.

Fig. 21 shows the number of flood-lights required to illuminate a given area to a desired intensity. These values apply to the 500 watt, 115 volt standard lighting service lamps. If the 300 watt lamp is used the number of flood-lights required, as indicated by the curve, should be multiplied by 1.8, and if the 200 watt flood-light is used the number of lamps required should be multiplied by 2.7.



## FLOOD LIGHT PERFORMANCE CURVES

## Golden Glow Mirror

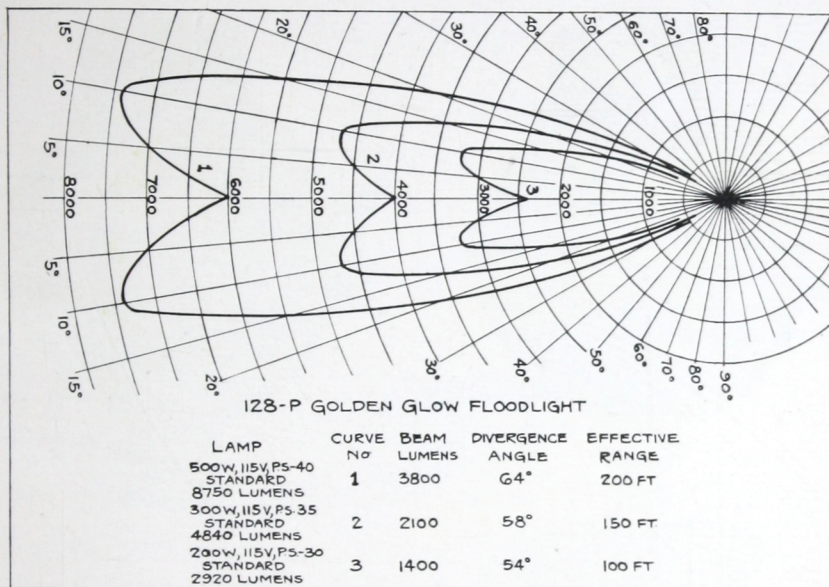


Figure 22

The type RC-128P unit was designed for use in modern high bay industrial lighting and other fields having similar requirements, where a lighting unit having a high efficiency and a comparatively narrow distribution angle is indicated.

Many buildings require lighting units that must be mounted fifty feet or more above the working plane, and in this field the RC-128P unit may be used to advantage.

A study of the distribution curves shown by Figure 22 will show the high overall efficiency of the unit and the smooth uniform light distribution that may be obtained by its use. Added to these advantages, is the superlative character of the light delivered by the Golden Glow reflector. This light, having a soft golden color, improves visibility conditions to a remarkable degree and relieves eye-strain and fatigue. This combination of reflecting efficiency and light color provides higher illumination levels with light of better quality without increasing current consumption for the lighting circuits.



## FLOOD LIGHTING PROJECTORS

### Golden Glow Type FLC-918



No. 22987



No. 22988

The type FLC-918 flood-lighting unit has been developed to fill the need for a small unit adapted to comparatively short range illumination, substantially constructed. The unit with suitable lamps is effective at ranges up to 600 feet and a beam divergence of 60 to 90 degrees is obtained.

The unit has found wide application in railroad work and coke oven illumination, being supplied in a cast iron case to withstand the effects of smoke and gases.

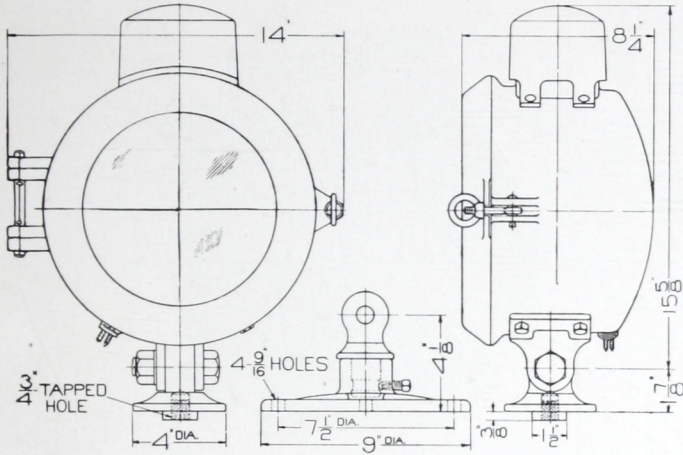
Type FLC-918 flood-lighting projectors are equipped with 9-inch diameter Golden Glow glass mirrored prismatic reflectors, particularly well suited for the greater penetration of fog, moisture and dust secured by the well-known greenish-yellow rays; its non-glaring properties and eye comfort being worthy of special consideration.

Cases consist of substantial castings providing for proper ventilation, have gasketed doors and equipped with Mogul socket to enable use of type C Mazda lamps of from 300 to 500 watts.



## FLOOD LIGHTING PROJECTORS

## Golden Glow Type FLC-918



Dimension Diagram

These projectors are supplied with two styles of bases as illustrated on the preceding page. Type A is a swivel base for mounting on flat surfaces, and type B is tapped in the bottom to receive a  $\frac{3}{4}$ -inch standard bolt for mounting on cross arms or steel structural work. Both types are supplied with hinged joint between base and body to allow for accurate adjustment.

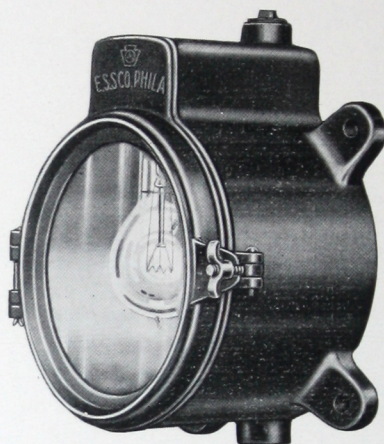
The characteristic curves showing the performance of this type flood-light are shown by Figures 23, 24, 25 and 26, on pages 57, 58 and 59.

| List No. |   | List Price<br>Each |
|----------|---|--------------------|
| 22987    | Type FLC-918 Golden Glow flood-lighting projector with type<br>A base, 9-inch prismatic reflector ..... | \$32.50            |
| 22988    | Type FLC-918 Golden Glow flood-lighting projector with type<br>B base, 9-inch prismatic reflector ..... | 30.60              |



## GOLDEN GLOW LIGHTING FIXTURES

Types RW and RWV-918



Type RW-918

Golden Glow roundhouse lighting fixtures, wall type, are designed particularly to meet the requirements of locomotive roundhouse service, but are also suitable for various other classes of steam railroad and industrial work, including the lighting of corridors, steel plants, refrigerating plants and various other locations where a stationary, substantial and weatherproof illuminating reflector unit is required.

The light produced by special Golden Glow prismatic glass mirror reflectors is particularly well suited for these classes of service on account of the greater penetration of fog, moisture and dust secured by the well-known greenish-yellow rays; its non-glaring properties and eye comfort being worthy of special consideration.

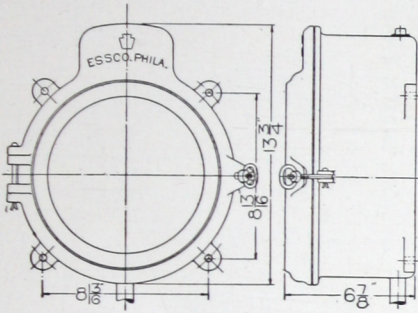
In the illumination of locomotive roundhouses by means of fixtures of this character, it is customary to place them on the wall at each end of the aisle, between the locomotive stalls. This results in a general diffusion of light in the space between the locomotives, illumination of the lower mechanism to maximum extent with a minimum of shadows.

These units are mounted in substantial cast iron cases with cast iron doors, equipped with rubber gaskets making the enclosure thoroughly vapor, gas and waterproof. The special prismatic Golden Glow reflectors being made of glass, cannot oxidize or tarnish and, therefore, remain permanently efficient and readily kept clean.

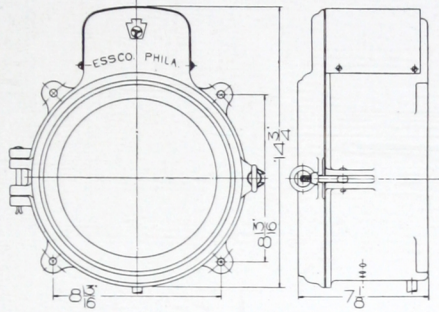


## GOLDEN GLOW LIGHTING FIXTURES

Types RW and RWV-918



No. 25634



No. 22643

Dimension Diagrams

This RW-918 fixture is made in two sizes; one to accommodate standard type C Mazda lamps up to and including 200 watt size, using a PS-30 bulb and medium screw base, and the other 300 or 500 watt lamps in PS-35 and PS-40 bulb, fitted with Mogul bases. Outlets are provided at both top and bottom of fixture to take  $\frac{1}{2}$ -inch standard conduit.

The characteristic curves showing the performance of this type flood-light are shown by Figures 23, 24, 25 and 26, on pages 57, 58 and 59.

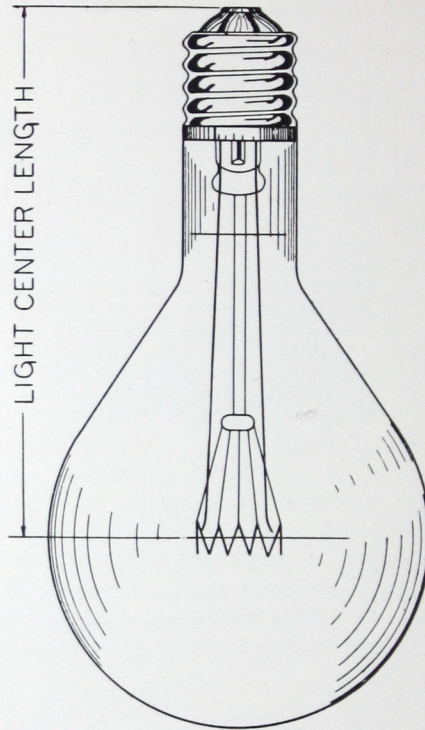
Principal dimensions are shown in diagrams above; prices do not include incandescent lamps.

| List No. |  | List Price<br>Each |
|----------|--|--------------------|
| 25634    | Type RW-918 roundhouse Golden Glow lighting fixture, wall<br>type for use with 200 watt lamp .....       | \$20.60            |
| 22643    | Type RWV-918 roundhouse Golden Glow lighting fixture, wall<br>type for use with 300-500 watt lamps ..... | 23.10              |



## INCANDESCENT PROJECTOR LAMPS

For Type 918-P Projectors



Mazda C lamps listed below are applicable for use with flood-lights using the type 918-P reflector. The lamps are standard multiple burning, in pear-shaped bulb, with medium screw or Mogul bases as noted.

In ordering, specify exact voltage of circuit on which the lamps are to be burned.

| List No. | Total Watts | Voltage | Style Bulb | Light Centre Length | Standard Package | List Price Each |
|----------|-------------|---------|------------|---------------------|------------------|-----------------|
| 44909    | 200         | 115     | PS-30      | 6 in.               | 24               | \$ .80          |
| 23356    | 300         | 115     | PS-35      | 7 "                 | 24               | 1.50            |
| 22514    | 500         | 115     | PS-40      | 7 "                 | 12               | 2.00            |



## FLOOD LIGHT PERFORMANCE CURVES

## Golden Glow Mirror

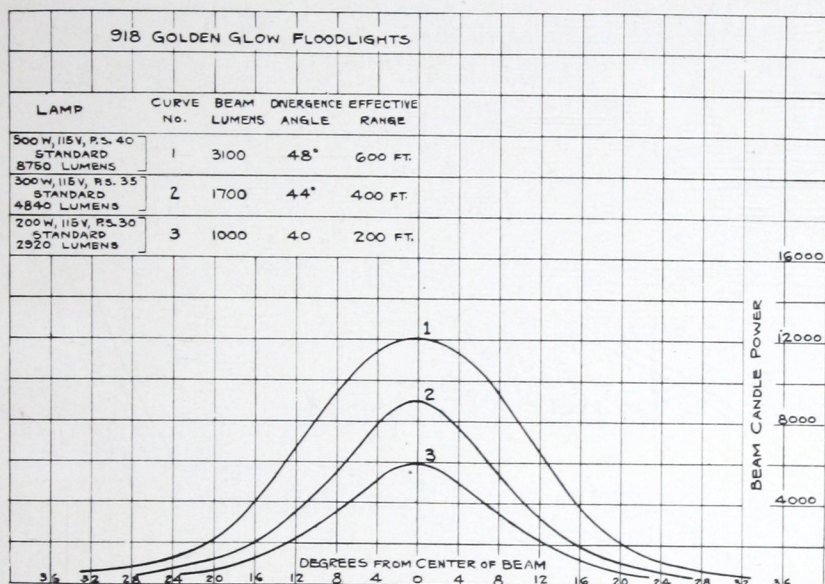


Figure 23

The light distribution curves for the type 918 Golden Glow flood-lights using 200, 300 and 500 watt standard lighting service lamps are shown in Fig. 23, above. Owing to the particular type of lens formation embodied in the front surface of this reflector, focal adjustments are unnecessary. This flood-light was designed for use at comparatively short ranges which requires a wide angle of distribution with smooth illumination.

The curves of Figure 23 are numbered, and the general characteristics of the flood-light using each lamp are given in tabular form. The values of beam lumens and diversion angles given are referred to the point on the curves where the beam intensity is ten percent of its maximum value. Experience has shown that this flood-light will deliver more lumens and has a much larger factor of spread than is indicated by these tabulated figures. This is due to the fact that the ten percent reference point generally used is too high for flood-lighting units operating at short ranges. A very considerable amount of useful light is present in the beam at points considerably beyond the ten percent reference point.

The values for effective range are largely derived from practical experience in the flood-lighting field and represent the maximum distance at which the flood-light will provide useful illumination when installed in accordance with present engineering practice.



## FLOOD LIGHT PERFORMANCE CURVES

## Golden Glow Mirror

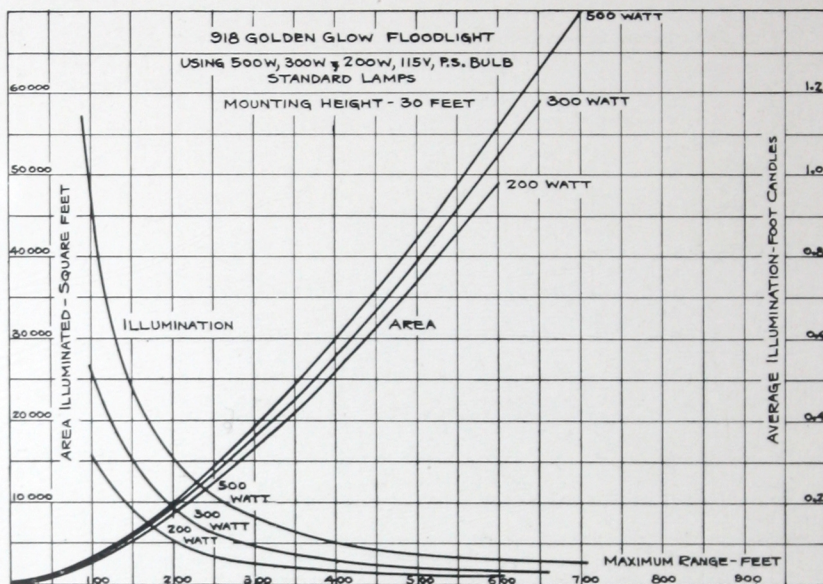


Figure 24

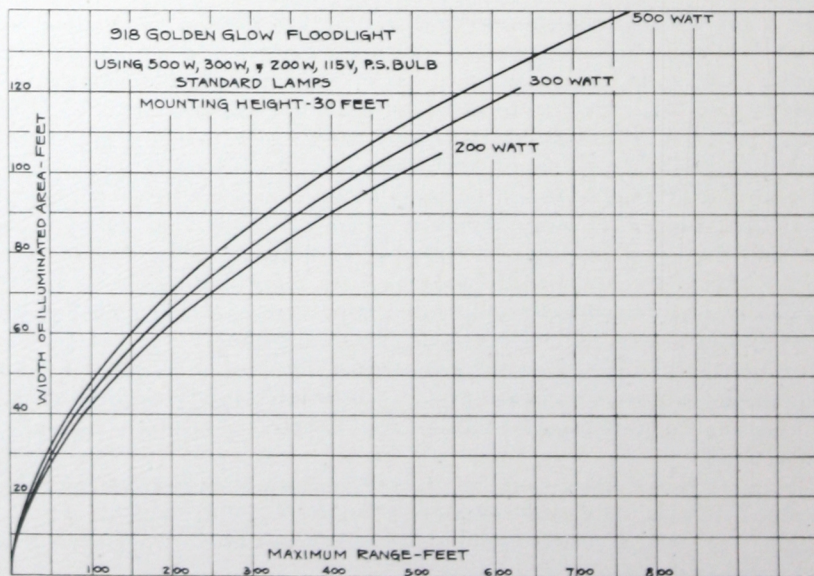


Figure 25



## FLOOD LIGHT PERFORMANCE CURVES

## Golden Glow Mirror

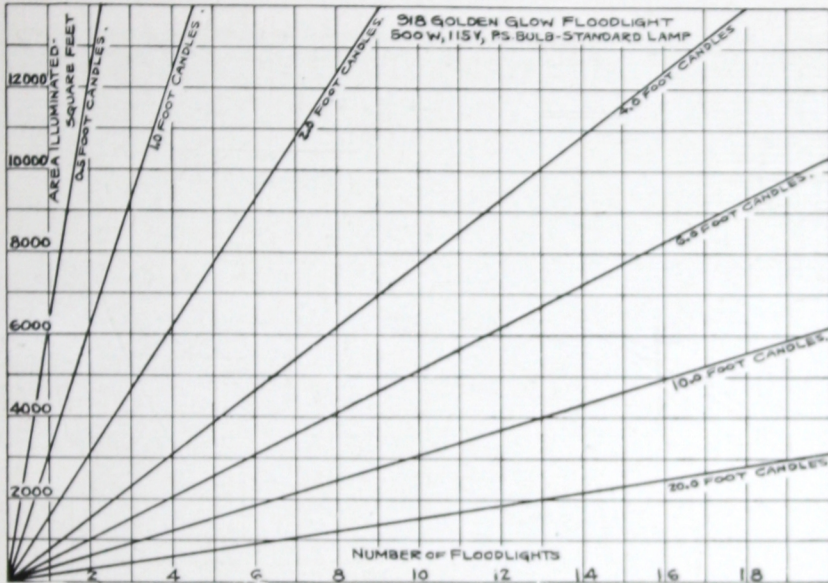


Figure 26

Fig. 24 shows the areas covered and the corresponding illumination values at various ranges for the lamps for which distribution curves are shown in Fig. 23. The mounting height used in preparing the curves was 30 feet, which is a fair average height for most industrial applications.

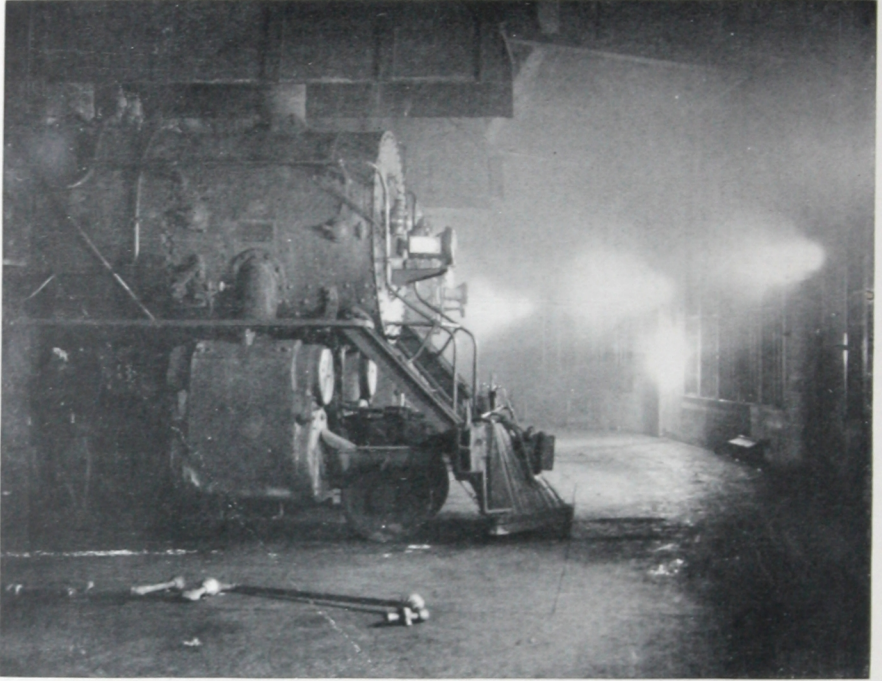
Fig. 25 shows the maximum beam width at various ranges for the lamps whose distribution curves are shown in Fig. 23. These beam widths as well as the areas shown in Fig. 24 are referred to the point where beam candle-power has fallen to a value that is 10 per cent. of its maximum. A very considerable amount of light is delivered by the projector that lies outside the limits of the 10 per cent. reference point, so that the values for beam lumens, dispersion angles, beam widths and areas covered appear smaller than the values actually found in practice.

Fig. 26 shows the number of flood-lights of this type required to illuminate a known area to a desired intensity, within the range of the usual applications for this flood-light. The curves are drawn for the 500 watt, 115 volt standard lighting service lamp. If the 300 watt lamp is used, the values for number of flood-lights required should be multiplied by 1.8, and if the 200 watt lamp is used this factor becomes 3.1.



## FLOOD LIGHTING PROJECTORS

Golden Glow or Crystal Mirror



Golden Glow Roundhouse Lighting

This photograph illustrates the use of the RW-918 flood-light in roundhouse illumination. These units mounted on the roundhouse walls and columns provide general illumination of excellent quality and, owing to their high efficiency, enable appreciable savings in current consumption. They require little attention owing to their gas tight construction and are easily accessible, effecting large reductions in maintenance cost.

This type of lighting unit is also admirably adapted for work pits both in roundhouses and car barns, and has been used very successfully in installations of this character owing to their rugged construction and durable character. They are also admirably suited for use in mines, steel mills and other locations subjected to severe smoke or gas conditions.



## FLOOD LIGHTING PROJECTORS

Golden Glow or Crystal Mirror



Golden Glow Flood-Lighting

The photograph shown above shows the kind of illumination obtained in an elevated railway car yard. Flood-lighting is particularly applicable to lighting trackage and shop areas on street railway properties. Flood-lighting has also been applied very successfully to car shop lighting in this same field and a large improvement in illumination obtained thereby. The use of flood-lights and the better lighting obtained from them invariably reduces operation cost and improves safety conditions and morale to a large degree.



## FLOOD LIGHTING PROJECTORS

## Characteristics

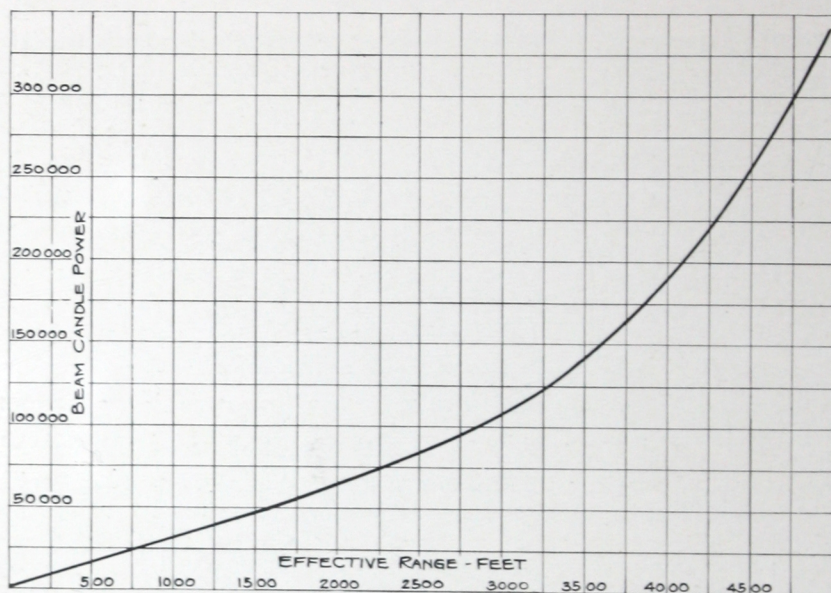


Figure 27

The curve of Figure 27 is given to serve as a guide in selecting the type of flood-light for a given lighting problem. The data used in developing this curve were obtained through experience in solving lighting problems, and are believed to be approximately correct.

In applying these data, the maximum range at which the flood-light is to be used, should be noted, and the corresponding beam candle power required from a single flood-light may be read from the curve.

A type of flood-light and lamp should be chosen that will deliver a beam candle-power sufficient to be effective at the required working distance, and a sufficient number of flood-light units used to provide the illumination intensity required.

It should be particularly noted, that the beam candle-power values indicated by the curve apply to a single flood-light only, and are in no way dependent upon the number of flood-lights used to produce the required illumination over a given area.



## GOLDEN GLOW FLOOD LIGHTING

### Installation



Golden Glow Flood-Lighting  
Yards of Southern Railway, Asheville, N. C.  
Illumination Intensity 0.06 foot candles.

The choice of a type of flood-light for any given application may be made from a consideration of the conditions to be met and the results desired. The types of flood-light listed herein are sufficiently diversified to meet any conditions that may be imposed.

Most flood-lighting problems can be solved without requiring the use of elaborate formulae and calculations. If the area to be illuminated in square feet, and the illumination intensity desired in foot candles, are known, the product of these factors is the required number of beam lumens that must be delivered by the flood-lights. A consideration of the mounting locations available and the distances from these locations to the surface to be illuminated will show the range at which the flood-light will be called upon to operate. It is obvious that the type of flood-light selected and lamp to be used with it should be such as to work well within the required operating range, and should have a beam distribution such that practically all of the light projected will be confined to the surface it is desired to illuminate. Further, the flood-light and lamp combination chosen should be such that the illumination from a single unit will cover a relatively large portion of the surface to be illuminated in order that the flood-light beams will overlap and provide the surface with smooth uniform illumination, bearing in mind that unless care is exercised in this respect, spotty illumination of a more or less unsatisfactory character will result.



## GOLDEN GLOW FLOOD LIGHTING

### Installation

These comments may be summarized in a few more or less general rules:

1. Choose flood-light locations to direct light as nearly perpendicular as possible to the surface to be illuminated.
2. Avoid spotty illumination by selecting flood-light and lamp combination to cover relatively areas and provide overlapping of areas illuminated by each flood-light.
3. Distribute light so that all sections of surface illuminated are uniformly bright.
4. Choose flood-light locations so that shadows, if any, are as nearly uniform in direction and density as possible.
5. Select flood-light locations and characteristics so that all the projected light possible is confined to the surface to be illuminated.
6. Conceal flood-light locations as thoroughly as conditions will permit.

Flood-lighting of building exteriors and objects of architectural interest should be so planned as to conform to the conditions obtaining in daylight, bearing in mind that daylight conditions may be approximated by a combination of strong directional light generally, downward if possible, supplemented by a general diffused illumination to relieve harsh shadows. Owing to the dependence of such lighting upon limiting conditions generally beyond control, and the complex character of these conditions, it is doubtful if any definite rules may be formulated to cover this class of lighting in detail.

Lighting of this character, depending as it does upon the appeal to the artistic senses, is admirably adapted to arrangements combining the spectacular and beautiful. Extreme care should be exercised to avoid exposed light sources or spotty illumination. Color effects by means of glass screens may be made highly attractive. A word of caution is suggested in that economy of installation, while always desirable, is frequently given undue weight. It is often true that installations planned with the economy idea predominating are unsatisfactory, because the artistic treatment of the project is inadequate. The first, last and only rule for this class of work should be "provide pleasing illumination."

A list including only the more important applications for which flood-lighting may be successfully used is given on following page, together with the maximum and minimum intensity values that have been found adequate. These figures are given with the thought that they may be of assistance in presenting definite figures applicable to certain fields of lighting, and as an aid to the development of a sense of proportion, so far as illumination levels go, in designing specific flood-light installations.



## GOLDEN GLOW FLOOD LIGHTING

## Installation

As a guide for the comparison of intensity values listed herewith, it will be well to remember that full moonlight corresponds to an intensity of approximately one-fiftieth (.02) foot-candles.

## Industrial

|  | Minimum | Illumination<br>Foot Candles<br>Maximum |
|--|---------|---|
| Aviation fields .....                              | 2.0     | 6.0                                     |
| Car barns .....                                    | 0.5     | 2.0                                     |
| Coal docks .....                                   | 1.0     | 4.0                                     |
| Coal piles .....                                   | 0.5     | 2.0                                     |
| Construction operations .....                      | 0.5     | 4.0                                     |
| Dredge operations .....                            | 0.5     | 2.0                                     |
| Factory yards and fences .....                     | 0.5     | 4.0                                     |
| Foundry yards .....                                | 0.5     | 2.0                                     |
| Foundries—General .....                            | 3.0     | 6.0                                     |
| Logging operations .....                           | 0.5     | 2.0                                     |
| Mining .....                                       | 0.5     | 2.0                                     |
| Oil fields .....                                   | 0.1     | 2.0                                     |
| Pier and dock lighting .....                       | 0.5     | 4.0                                     |
| Quarries .....                                     | 1.0     | 4.0                                     |
| Railroad yards—General .....                       | 0.04    | 0.2                                     |
| Railroad yards—Roundhouse and terminal areas ..... | 0.5     | 2.0                                     |
| Steel mills—Charging and Casting floors .....      | 1.0     | 4.0                                     |
| Steel mills—Raw material storage areas .....       | 0.1     | 0.5                                     |

## Advertising

|                                |      |      |
|--------------------------------|------|------|
| Banners .....                  | 6.0  | 20.0 |
| Bill boards and signs .....    | 6.0  | 12.0 |
| Building exteriors—Light ..... | 4.0  | 12.0 |
| Building exteriors—Dark .....  | 10.0 | 30.0 |
| Exhibits .....                 | 4.0  | 12.0 |
| Parade floats .....            | 4.0  | 12.0 |
| Real estate tracts .....       | 2.0  | 6.0  |
| Spectacular lighting .....     | 10.0 | 30.0 |
| Spray pond condensers .....    | 1.0  | 4.0  |
| Stained glass windows .....    | 4.0  | 12.0 |
| Street squares .....           | 0.5  | 2.0  |

## Architectural

|                                |      |      |
|--------------------------------|------|------|
| Building exteriors—Light ..... | 4.0  | 12.0 |
| Building exteriors—Dark .....  | 10.0 | 30.0 |
| Fountains .....                | 4.0  | 12.0 |
| Gardens .....                  | 1.0  | 4.0  |
| Park areas .....               | 0.5  | 2.0  |
| Statues—Light .....            | 2.0  | 6.0  |
| Statues—Dark .....             | 4.0  | 12.0 |

## Recreation

|  |     |      |
|--|-----|------|
| Athletic fields .....                    | 1.0 | 4.0  |
| Bathing beaches .....                    | 2.0 | 6.0  |
| Gymnasiums .....                         | 2.0 | 6.0  |
| Skating rinks and ponds .....            | 1.0 | 4.0  |
| Stadiums .....                           | 1.0 | 4.0  |
| Trap shooting—General illumination ..... | 0.5 | 2.0  |
| Trap shooting—Targets .....              | 4.0 | 12.0 |



## FLOOD LIGHTING PROJECTORS

## Characteristics

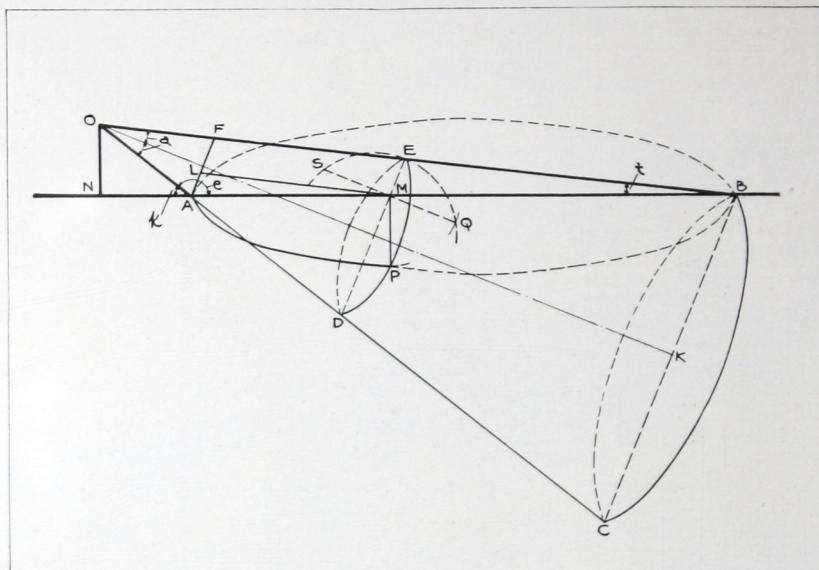


Figure 28

The following analysis will show that the areas covered by a flood-light unit at various distances, and when used with various mounting heights, may be arrived at from some elementary geometrical considerations, and that the working formulae obtained are simple and easily handled.

In Fig. 28, the cone formed by the lines OB and OC define a cone which is used to represent the beam from a flood-light located at O. The plane of the ground or of the surface illuminated is indicated by the line NB, and the mounting height for the flood-light, or the distance from the plane illuminated to the flood-light location is indicated by ON.

AF is parallel to ED and BC, and normal to the axis of the cone formed by the beam from the flood-light at O. ML is parallel to OB. The line AMB is in the plane of the illuminated surface, and is also in the plane of the axis of the flood-light beam at right angle to the surface illuminated. MP is perpendicular to AMB in the plane of the illuminated surface and is one-half the width of the illuminated area at M, MP being equal to MQ and MS.

Let  $AM = x$ ,  $MP = y$ ,  $OA = c$ ,  $KOC = a$ ,  $OAM = e$  and  $AML$  will be equal to  $(180 - e - 2a) = t$ .

$$\text{Now } \frac{MD}{MA} = \frac{\sin MAD}{\sin MDA} = \frac{\sin e}{\cos a} \text{ and } MD = \frac{x \sin e}{\cos a}$$

$$EM = FL = FA - AL = 2c \sin a - AL$$

$$\frac{AL}{AM} = \frac{\sin AML}{\sin ALM} = \frac{\sin (180 - e - 2a)}{\sin (90 + a)}$$



## FLOOD LIGHTING PROJECTORS

### Characteristics

$$\text{thus AL} = \frac{x \sin (e + 2a)}{\cos a}$$

$$\text{and EM} = 2 c \sin a - \frac{x \sin (e + 2a)}{\cos a}$$

From a property of the circle  $(MP)^2 = EM - MD$  therefore

$$y^2 = \left[ \frac{x \sin e}{\cos a} \right] 2 c \sin a - \frac{x \sin (e + 2a)}{\cos a}$$

let  $ON = h$ ,  $NB = r$  and  $AB = l$

$$t = (180 - e - 2a) = \tan^{-1} \frac{h}{r} \quad k = (180 - e) = \sin^{-1} \frac{h}{r} = t + 2a$$

$$h = c \sin e \text{ and } c = \frac{h}{\sin e}$$

Now rewriting our equation for  $y$  in the form

$$y^2 = \left[ \frac{\sin e \sin (e - 2a)}{\cos^2 a} \right] \left[ \frac{2 h \sin a \cos a}{\sin e \sin (e - 2a)} \right] x - x^2$$

and supposing  $(e + 2a)$  to be less than 180 degrees, we may compare this equation with

$$y^2 = \frac{b^2}{a^2} (2 a x - x^2) \quad \text{and we have}$$

$$2 a = l = \left[ \frac{2 h \sin a \cos a}{\sin e \sin (e + 2a)} \right] \left[ \frac{h \sin 2a}{\sin e \sin (e + 2a)} \right]$$

$$\frac{b^2}{a^2} = \frac{\sin e \sin (e - 2a)}{\cos^2 a} \text{ and } b^2 = \frac{h^2 \sin^2 a}{\sin e \sin (e + 2a)}$$

$$b = \frac{h^2 \sin^2 a}{\sin e \sin (e + 2a)} \text{ and } w = 2 b = 2 h \sin a \sqrt{\frac{1}{\sin e \sin (e + 2a)}}$$



## FLOOD LIGHTING PROJECTORS

## Characteristics

From a property of triangles we may write  $(t + 2a + e) = 180$  and  $(e + 2a) = (180 - t)$  so that  $\sin(e + 2a)$  may be written  $\sin t$  and in the same manner  $\sin e$  may be written  $\sin k$ .

Now we may write:

$$(1) \quad l = \frac{h \sin 2a}{\sin t \sin k} \quad \text{and}$$

$$(2) \quad w = 2h \sin a \sqrt{\frac{1}{\sin t \sin k}}$$

and the area of the ellipse defining the portion of the plane  $NB$  illuminated by the flood-light at  $0$  is given by

$$(3) \quad A = .785 l w.$$

Now since  $2a$  is the total dispersion angle of the flood-light, and  $h$  and  $r$  are known, the length, width and area of the surface illuminated may be readily calculated.

Assume for example the type FLA-1419 flood-light used at a maximum range of 3000 feet and mounted 70 feet above the ground.

$$t = \tan^{-1} \frac{h}{r} = \tan^{-1} \frac{70}{3000} = \tan^{-1} .023 = 1.33 \text{ degrees and } \sin t = .0233$$

$2a$  from the distribution curves of this flood-light is found to be 19 degrees, hence  $\sin 2a = .3256$  and  $\sin a = .165$ .

$k = (t + 2a)$  from the foregoing is 20.33 degrees and  $\sin k = .3474$

Now

$$l = \frac{70 \times .3256}{.0233 \times .3474} = 2816 \text{ feet}$$

$$w = 2 \times 70 \times .165 \sqrt{\frac{1}{.0233 \times .3474}} = 257 \text{ feet}$$

and  $A = .785 \times 2816 \times 257 = 568,114$  square feet.

The foregoing analysis is given for the purpose of showing the relations existing between flood-light beam characteristics and the areas illuminated.

It may be noted that formulas 1, 2 and 3 are comparatively simple, and these formulas together with the dispersion characteristics of a flood-light and the range at which it is to be used, and its mounting height are sufficient to determine the area covered by the unit.

These formulas were used in developing the flood-light performance curves given in the earlier part of this book. These curves provide a convenient way of showing the performance characteristics of a given flood-light under average conditions, and it is believed they will be quite useful. The same method may be followed in developing the characteristics of any type of flood-light with any given lamp, providing only the light distribution curves of the flood-light are available. Distribution curves of this character may be obtained upon request to cover any type of flood-light with any lamp that is desired.



## GOLDEN GLOW SEARCHLIGHTS

Golden Glow or Crystal Mirror



All-Brass  
Type DDS-54

Suitable for small boats or as spot-light. Fitted with 5-inch reflector and adjustment screw for focusing.



All-Iron  
Type HDC-74

A small but very durable lamp for commercial craft. Focused by moving the lamp bulb inward or outward by hand. Fitted with 7-inch reflector.



All-Brass Types  
CPS-96 and CPS-128

Same as types DDS-96 and DDS-128 excepting that control mechanism is provided. Designed for installation on cabin roof.



All-Brass Types  
DDS-96 and DDS-128

These types differ only in size, being fitted with 9-inch and 12-inch reflectors, respectively. Body adjustable to any desired position and bulb is adjustable to focal point by screw at rear.



## GOLDEN GLOW SEARCHLIGHTS

Golden Glow or Crystal Mirror

All-Brass Types  
CSS-96 and CSS-128

These types are fitted with control mechanism, as illustrated, and supplied in two sizes having 9-inch and 12-inch reflectors, respectively. Lamp bulb can be accurately focused by rear screw.



All-Steel Types  
CSSB-96 and CSSB-128

Used as searchlights or harbor lights, being fitted with control mechanism, as illustrated. Made in two sizes having 9-inch and 12-inch reflectors, respectively, and accurate focusing screw device.



All-Steel Type CPB-1412  
Form 5

Particularly suitable for tugs and other harbor craft. Fitted with commutator base and cabin control. Have mogul base socket and focusing device. Supplied only with 14-inch reflector.



---

ELECTRIC SERVICE SUPPLIES COMPANY

---



Main Office and Factory—Philadelphia











# GOLDEN GLOW



ELECTRIC SERVICE SUPPLIES Co.